

I've gotta PhD collaboration - iGEM Rochester

Post for Sep. 1st

(IveGottaPhD) | 【Basic Health Care: iGEM Rochester 2020 - Endometriosis】



Have you heard of endometriosis? Do you know the symptoms about this disease?

The population of endometriosis is about 10% of the total female population, that is, there is about 378 million women in the world who suffer from endometriosis. According to the current research, this disease may cause menstrual pain and even infertility!

Let iGEM Rochester show you the knowledge about it!



[University of Rochester iGEM 2020](#), composed of twelve highly motivated students from all over the world and from a variety of biological and engineering disciplines, sought to improve the diagnostic for endometriosis using menstrual effluent. Endometriosis is a chronic disease that causes aberrant endometrial-like tissue growth outside of the uterine cavity. It affects more than 200 million women worldwide and can lead to severe symptoms impacting reproductive health. There are no current diagnostics available except for exploratory surgery. Our wet-lab worked hard to find biomarkers for endometriosis in menstrual effluent and collaborate with top physicians and researchers in the field to create lateral flow assays that can both qualitatively and quantitatively measure the presence of these biomarkers in menstrual effluent. This work was supported by the efforts of the modeling team, who worked to create a predictive model to estimate an endometriosis diagnostic based on several clinical and laboratory variables and the hardware team who worked to create a menstrual cup best suited for the collection of menstrual effluent and the comfort of endometriosis patients as well as inexpensive laboratory equipment for clinics without easy laboratory access. Simultaneously, we are also focusing on community involvement to raise people's awareness about Endometriosis. We plan to launch an educational website focusing on five different age groups with informational collected from recent scientific peer-reviewed literature, a software helping the user to determine their potential risk of having Endometriosis, a campaign focusing on women's right and women's health, and posters in doctor's offices for educational

purpose. To get in touch with members of the team or to follow the work, please contact Nello via email [uofr.igem@gmail.com]



Clip for the poster: [<https://drive.google.com/drive/u/4/folders/1Qi2yINjPhmn6i-SnNECn6l-VdrAJ2yz2>]



If you want to know more about this disease, follow our Facebook fan page! We will show you more information next time. Don't miss it!



Feel free to contact us for more information:

Facebook: I've Gotta PhD [<https://www.facebook.com/Ive-gotta-PhD-105826301230041/>]

email: [phdigem2020@gmail.com]

Instagram: @igem_csmu @igemncku

Next Up: 【Basic Health Care: iGEM Rochester 2020 - Endometriosis】 ➡➡➡

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The collage consists of four educational posters:

- Period Products:** A pink poster titled "period products" that provides information about different types of period products, including tampons and menstrual cups, and their costs. It includes a QR code and social media links.
- Women's Reproductive Health:** A teal poster titled "WOMEN'S reproductive health" that features a diagram of the female reproductive system and lists common conditions such as fibroids, polyps, endometriosis, adenomyosis, and polycystic ovary syndrome (PCOS).
- Sexually Transmitted Diseases (STDs):** A pink poster titled "Sexually Transmitted Diseases (STDs)" that explains what STDs are, how they are spread, and how they can be prevented. It includes a diagram of the human body showing the locations of various STDs.
- Typical Menstrual Cycle:** A pink poster titled "a typical menstrual cycle lasts 21-35 days" that includes a circular diagram showing the phases of the menstrual cycle and the days when different symptoms are likely to occur.

How normal is your period?

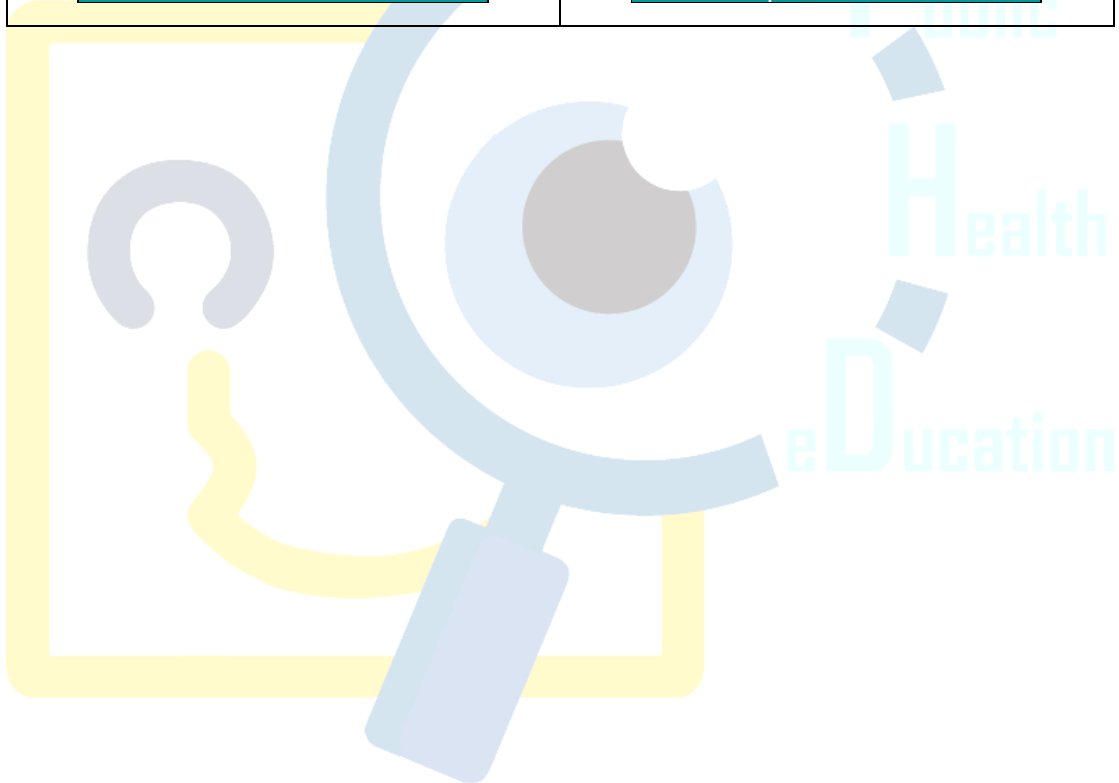
- * **INFERTILITY**
- * HEAVY MENSTRUAL PERIODS
- **TIRED & NAUSEOUS**
- * LOW BACK PAIN
- SPOTTING & BLEEDING BETWEEN CYCLES
- * **PELVIC PAIN**
- * CONSTIPATION
- * PAIN DURING URINATION
- * BLOATING
- * PAIN DURING OR AFTER SEX
- * MENSTRUAL CRAMPS
- * DIARRHEA
- * LOWER ABDOMINAL PAIN

Ask your doctor about endometriosis

10 Facts you didn't know about Endometriosis

Endometriosis is a painful disorder in which tissue similar to the tissue that normally lines the inside of your uterus grows outside your uterus

- 1 in 10 women affected during their reproductive years
- 176 million women around the world are victim to this disease
- it takes an average of 7 years to diagnose
- there is NO cure
- \$18-22 Billion economic burden to health systems
- leading cause of infertility
- 80% miss work due to pain
- 9th largest country, if all the women that suffered from endometriosis were put in the same country
- only 20% of the population know what endometriosis is
- the only way to know if you have it is surgery



Post for Sep. 5th

(IveGottaPhD) | 【Basic Health Care: iGEM Rochester 2020 - Endometriosis】

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Here comes iGEM Rochester again! This time they use delicate posters to introduce endometriosis, including signs and symptoms of this disease. Moreover, they share basic knowledge of endometriosis with us, from adolescents to adults to post-menopausal women. Let's check it out together! And if you haven't read the previous post from iGEM Rochester, just follow our fan page and you'll get the latest information!

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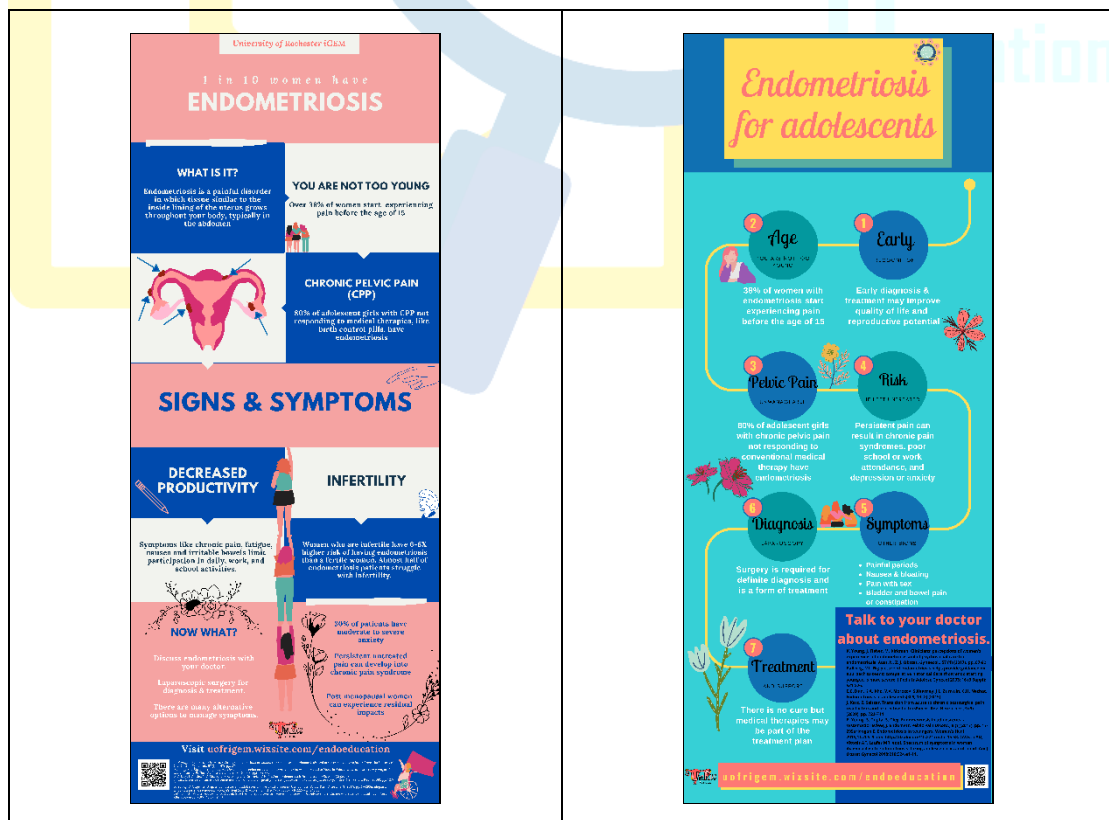
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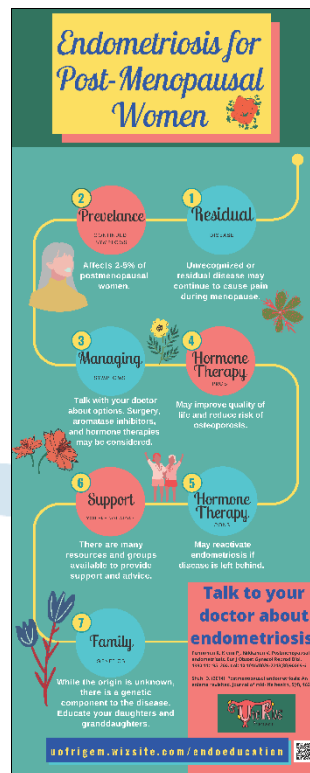
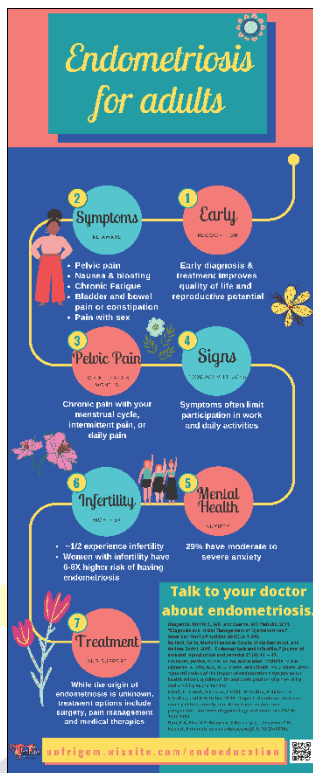
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Post for Sep. 8th

(IveGottaPhD) | 【Basic Health Care: iGEM Rochester 2020 - Endometriosis】



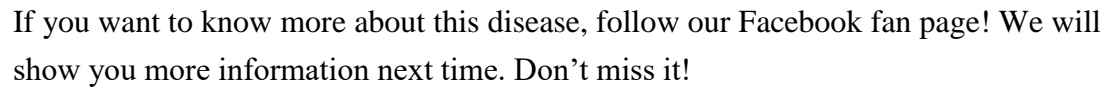
Here comes the final post of Rochester iGEM team. Let conclude there project and the information they want to convey with their delicate brochure! If you are still not familiar with endometriosis and Rochester team, don't miss this last chance!



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Endometriosis


FOR POST-MENOPAUSAL WOMEN

What is it

Endometriosis is a chronic disease where the endometrium of the uterus (similar to the type that lines inside your uterus) grows outside of the uterus and other organs in your abdomen can cause inflammation, scarring, damage to nearby structures, intense pain and even infertility.¹

It may affect up to 2-5% of postmenopausal women. Typically these women have had known that or have symptoms all of their lives that were not recognized or ignored.

The risk of ovarian cancer can increase in women with endometriosis. However, this is very rare.



Endometriosis lesions

Diagnosis & Treatments

The Diagnosis

- 1. Pelvic Exam, Ultrasound, or MRI
- 2. **Laparoscopy** - Gold standard minimally invasive diagnostic procedure allowing the doctor to see and remove disease.

Treatment 1: Discontinue HR Treatment

The hormone replacement would be discontinued if it reactivates symptoms.

Treatment 2: Stepwise Surgery

Laparoscopy is typically used to remove any endometriosis, reduce or control ovarian. Hysterectomy can be reserved for select cases in which the disease and the uterus are both removed. Insurance could still happen.


Treatment 3: Aromatase Inhibitor

If recurrence happens after surgery, Aromatase inhibitor may be an option as they block or block estrogen biosynthesis within the lesions.

Symptoms

1. Pelvic pain \geq 6 months
2. Unbearable Pain during intercourse
3. Painful bowel movements
4. Painful urination
5. Chronic fatigue
6. Low back pain
7. Diaphragmatic/lung pain

Women may have had these symptoms throughout their lives and endometriosis is unlikely to develop newly in postmenopausal women.



UTERUS
2016-2020

To Learn More about Us

Website

uofrigem.wixsite.com/endeducation

Email
uofrigem@gmail.com

Instagram
uofrigem.2020

Twitter
ur_igem

Facebook
rochester.igem.2020

Address
500 Joseph C. Wilson Blvd, Rochester, NY, 14627

Endometriosis

for
Adults
2020



Designed by
University of Rochester IGEAM 2020

Reference

1. American College of Obstetrics and Gynecology. Endometriosis. *Obstetrics and Gynecology*. 2019;133(5):e131-e142.
2. American College of Obstetrics and Gynecology. Endometriosis. *Obstetrics and Gynecology*. 2019;133(5):e131-e142.
3. American College of Obstetrics and Gynecology. Endometriosis. *Obstetrics and Gynecology*. 2019;133(5):e131-e142.
4. American College of Obstetrics and Gynecology. Endometriosis. *Obstetrics and Gynecology*. 2019;133(5):e131-e142.
5. American College of Obstetrics and Gynecology. Endometriosis. *Obstetrics and Gynecology*. 2019;133(5):e131-e142.
6. American College of Obstetrics and Gynecology. Endometriosis. *Obstetrics and Gynecology*. 2019;133(5):e131-e142.
7. American College of Obstetrics and Gynecology. Endometriosis. *Obstetrics and Gynecology*. 2019;133(5):e131-e142.
8. American College of Obstetrics and Gynecology. Endometriosis. *Obstetrics and Gynecology*. 2019;133(5):e131-e142.
9. American College of Obstetrics and Gynecology. Endometriosis. *Obstetrics and Gynecology*. 2019;133(5):e131-e142.
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What is Endometriosis

Endometriosis is a chronic disease where the endometrial-like tissue (similar to the type that lines inside your uterus) grows outside of the uterus and other organs in your abdomen, and cause inflammation, scarring, damage to nearby structures, intense pain and even infertility. [1,2]



Some Facts about Endometriosis

- The cause of endometriosis is not known
- Endometriosis affects 1 in 10 menstruating people
- Endometriosis often runs in families therefore a genetic component is suspected
- Endometriosis is not pure painful periods
- There is no prevention for endometriosis, but treatments can help

Symptoms

Endometriosis symptoms can vary from person to person. Some people may experience no symptoms at all, while others may experience severe pain and infertility. Symptoms may include:

- Painful periods (dysmenorrhea)
- Painful intercourse (dyspareunia)
- Heavy menstrual bleeding
- Painful bowel movements
- Painful urination
- Fatigue
- Infertility



Diagnostics

Diagnostic ability
Cost
Operator Dependence

Pelvic Exam

- for deep endometriosis
- for peritoneal endometriosis
- highly operator-dependent
- Low Cost

Ultrasonography

- for deep endometriosis
- for peritoneal endometriosis
- highly operator-dependent
- Normal Cost

Magnetic Resonance Imaging (MRI)

- for deep endometriosis
- for peritoneal endometriosis
- highly operator-dependent
- High Cost

Laparoscopy

- for almost any endometriosis
- highly operator-dependent
- Extremely High Cost (but may lead to improvement in symptoms)

Treatment

Medical Treatment

- **Description:** Different types of birth control to stop periods, and pain medications to manage symptoms
- **Advantage:** Cheap, low risk, may control symptoms
- **Disadvantage:** Do not get rid of endometriosis, cannot get pregnant while using
- **Examples:** Pills, patch, vaginal ring, injections, and IUD

Surgery

- **Description:** Laparoscopic surgery to remove endometriotic tissue, and normalize or improve the anatomy
- **Advantage:** Can both improve fertility and alleviate pain
- **Disadvantage:** Endometriosis often comes back, and surgery may lead to extra scar tissue

Risk Factors

- **Earlier age WITH FIRST PERIOD:** < 12 years¹
- **Shorter menstrual cycles:** < 26 days¹
- **Reproductive History:** Infertility
- **Body type:** Thinner people
- **Diet:** Higher risk for those eating highly processed foods (lower risk in vegetarians)
- **Anti-inflammatory diets MAY decrease the risk**

LEARN MORE ABOUT US

Website:
uofrigem.wixsite.com/endeducation

Email:
uofrigem@gmail.com

Instagram:
uofrigem.2020

Twitter:
ur_igem

Facebook:
rochester.igem.2020

Address:
500 Joseph C. Wilson Blvd,
Rochester, NY, 14627

University of Rochester IGEAM 2020

ENDOMETRIOSIS

For the adolescents

SYMPTOMS

1. Chronic pelvic pain and cyclic anterior pelvic pain during period that is not responsive to NSAIDs or birth control
2. Pain with sex
3. Bloating and bowel pain
4. Constipation/diarrhea
5. Nausea/bloating
6. Severe fatigue, anxiety/depression

RISK FACTORS

1. Genetic/family history of painful periods or endometriosis
2. Early first period (prior to 12 years old)
3. Low BMI
4. Exposure to environmental chemicals
5. Passive smoking exposure

¹ NIH, Igem 2019 is low risk for adolescents with first period prior to age 12. Many are diagnosed with endometriosis before age 18.

38% of women with endometriosis started experiencing pelvic pain before 15 years of age. [1] The youngest was documented at the age of eight. [2]

“Teenagers with endometriosis often wait for 4.6 years before seeking advice and another 4.7 years before finally being diagnosed. [3]”

67-73% of adolescents with pain that does not respond to NSAIDs or the pill have endometriosis. [4]

CURRENT TREATMENT

NON-HORMONAL THERAPY

Pain relievers (Non-steroidal anti-inflammatory drugs) such as ibuprofen or naproxen sodium.

HORMONAL THERAPY

1. Hormonal contraceptives (birth control pills, patches, etc.)
2. Levonorgestrel IUD
3. GnRH analogues (only given to individuals over 18 years old when hormonal treatments and birth control fail)

SURGICAL EXCISION

Complete laparoscopic excision may significantly reduce the recurrence rates of endometriosis in adolescents.

I've gotta PhD collaboration - iGEM BNU-China

Post for Sep. 11st

(IveGottaPhD) | 【Research: iGEM BNU-China 2020 - Lineage Tracing】

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The next team is BNU-China with Research. They made a colorful and detailed poster to introduce (the knowledge of) Lineage Tracing. What is this technology and how does it work? Let's follow the BNU-China team and know more about it!

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If you want to know more about science technology, follow our Facebook fan page! We will show you more information next time. Don't miss it!

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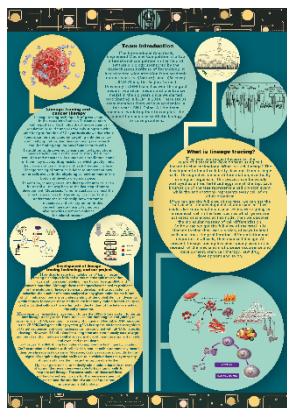
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Next Up: 【Science Communication: iGEM ZJU - Covid 19】 ➡➡➡

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What is lineage tracing?

This year our project focuses on the study of disease and development using cell lineage tracing technology. What is a cell lineage? The development of multicellularity develops from a single cell, through division and differentiation, eventually forming an organism. This process can be vividly portrayed as a tree: fertilized eggs are at the top. Each bifurcation of the tree represents a cell division event, while the end (bottom) represents every cell of an adult organism.

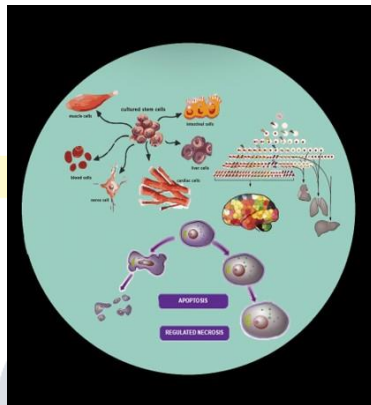
If we can get the full view of the tree, we can get the full view of the development of an organism. If we could also know what molecular events were going on inside each cell in the tree, such as which genes are activated or silenced at this node, then we discover the molecular mystery of cell differentiation.

Lineage tracing uses a variety of ways to label cells and track the proliferation, differentiation and migration of all cells, then map cell lineage. At present, lineage tracing has been widely used in the research of the mechanism of disease occurrence and development, stem cell therapy, new drug development and so on.

Lineage tracing and cancer therapy

Lineage tracing technique is of great value in the research of cancer. The cancer stem cell hypothesis (CSC) holds that the rare stem cell population in solid tumors is the only subgroup with unlimited proliferation. CSC hypothesis shows that whole tumors can be eradicated by targeting only the cancer stem cell population. And lineage tracing is a powerful tool for finding populations of cancer stem cells.

In addition, in many cases, the lineage of tumor cells can be traced all the way back to the last step of tumor development: Metastasis. Tumor metastasis is almost the direct cause of death. Therefore, it is important to understand the relationship between tumor metastasis and primary tumor. In this respect, lineage tracing technology also provides great convenience for related research.



Development of lineage tracing technology and our project

Recently, researchers have begun to use the CRISPR/Cas9 system to design new lineage tracing tools. These tools use non-homologous end-joining to repair errors in DNA, resulting in a variety of unique and heritable DNA barcodes. In the CRISPR/Cas9 gene editing system, gRNA is responsible for the recognition of target sequences, and Cas9 nucleases can be combined with gRNA for specific cleavage. However, if Cas9 exists for a long time and continuously cuts, a large number of random mutations will affect normal growth and development of cells, and even lead to cell death.

So this year the BNU-China team plans to improve the technique by coupling Cas9 expression and action with cell division, and let cells autonomously record their own lineage in its genome. Moreover, Cas9 was degraded rapidly by degradation signal linked to it, which reduce the cytotoxicity of Cas9 and make the lineage tracing possible further.

I've gotta PhD collaboration - iGEM ZJU-China

Post for Sep. 15th

I've Gotta PhD | 【Science communication : COVID-19】



Do you know what synthetic biology is? In this COVID-19 pandemic, team iGEM ZJU-China tries to use this amazing technology to overcome this pandemic. However, as the old saying goes, know your enemy and know yourself. To face COVID-19, we should learn more about it. Thus, ZJU team made some delicate posts for everyone! Let's check it out!



Hello everyone, we are iGEM ZJU-China 2020! This year, the prevalence of COVID-19 has changed our life style greatly, many people suffer from this. As iGEMers, we hope to do something that can help people to know more about what we are facing, what should we do, so that people won't be so afraid of COVID-19 due to being uneducated.



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■ Next Up: 【Break discrimination and racism : Obstetric violence 】 ➡➡➡➡

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Crop Modification

Crops obtain the necessary nitrogen for growth from the soil. When the amount of nitrogen in the soil is not enough to support the growth of the crop, it usually needs artificial fertilization. However, the application of a large amount of fertilizer would cause problems such as water pollution and soil compaction. Therefore, scientists are trying to introduce nitrogen fixing genes related to rhizobia into crops so that crops could independently fix nitrogen for their growth.

Malaria is a worldwide epidemic that seriously threatens human life. There are 1 billion people living in malaria endemic areas around the world. Every year, about 200 million people suffer from this disease and more than one million die from it. Artemisinin is the most effective and impactful antimalarial drugs. However, extracting artemisinin from *Artemisia annua*, a type of wormwood, can not meet the needs of human beings. Scientists have introduced artemisinin synthesis-related genes into yeast cells and have used yeast cells to produce artemisinin in large quantities.

Natural Product Synthesis

WHAT IS Synthetic Biology?

Synthetic biology is a subject that synthesizes new organisms. Synthetic biologists solve energy, materials, health and environmental issues by designing and constructing artificial biological systems that do not exist in nature. In the eyes of synthetic biologists, biology is a tall building, and all biological macromolecules are parts that can be standardized. Using these standardized parts, we can build lives we need like building Lego bricks. Synthetic biology is basically divided into two categories. One is to use unnatural biological components to try to build a completely artificial life system in vitro, the other is to modify existing organisms to lose or gain specific abilities by removing part of the natural system or implanting artificial systems.

Genes regulate all life activities of the living body. We artificially divide genes into housekeeping genes and luxury genes. Housekeeping genes are necessary to maintain the basic life activities of cells, and luxury genes endow cells with specific physiological functions. Scientists can construct the simplest living form by keeping housekeeping genes and removing luxury genes. The simplest living form provides a minimalist chassis for the transformation of synthetic biology, and also helps humans to further understand the mysteries of life.

Construct the Simplest Life Form

VIRUS

Virus

The virus is the tiniest creature found in the world, with very simple structure. Most viruses only have genetic material (one of RNA or DNA) and protein capsid. The virus cannot complete the replication independently, and can only plan to sneak into the cell and steal the resources of it.

SARS-CoV-2

Cumulatively, nearly 2 million COVID-19 cases and 900,000 deaths have been reported by WHO (World Health Organization). SARS-CoV-2 has had wide global impact on global public health since its first reports. On the one hand, it has the devastating infective power and transmission speed; on the other hand, it endows human health and even livestock characteristics are related to the structure and intelligent mechanism of pathogenic SARS-CoV-2.

Smuggling cell membrane

After breaking through several layers of defense, the human skin and mucous, the virus finally came to the cell membrane. Generally speaking, the cell membrane is guarded by various immune proteins and the virus cannot enter. But SARS-CoV-2 has found a breakthrough, which is a receptor protein called ACE2 with multiple roles. The spike protein of SARS-CoV-2 could be used as a key to open the lock of ACE2, and the SARS-CoV-2 membrane smuggled in RNA into the cell.

After entering the cell, the new Corona virus hijacked the cell replication mechanism, and the whole cell had to produce what it needed for virus replication.

When the number of viruses in the cell reached a certain amount, the whole cell without sufficient virus will disintegrate completely. The viruses that multiplied in the cell city would leave the cell and find their next target respectively.

Public Health Recommendations

The current situation of COVID-19 is still severe. We make the following suggestions based on the guidelines of the WHO:

1. Wash your hands: Regularly and thoroughly clean your hands with an alcohol-based hand rub or wash them with soap and water.
2. Keep a social distance: Maintain at least 1 meter (3 feet) distance between yourself and others, avoid going to crowded places.
3. Try to wear a mask: Wear a mask whenever possible to protect yourself and others from infection.
4. Avoid medical services properly: If you have a fever, cough and difficulty breathing, seek medical attention, be told by symptoms in advance if possible and follow the directions of your local health authority.

IMMUNE WAR

Antibody troops

A group of antibodies not only have strong combat capability, but also have the function of precise strike.

In essence, antibody is a member of protein. It has a structure that can accurately combine with specific invaders so that antibody can accurately hit its target. Although the ability of a single antibody is very limited, the cooperation between different antibody units can well maintain the stability of the intracellular environment.

It is acknowledged that the fighting methods of different antibodies are different. For example, the antibody of 2019-nCoV cooperates with the membrane proteins to block the 2019-nCoV from entering the cell membrane, while it seems there are also indirect antibodies that directly bombard the virus cell and die with the virus.

Immune cells

Immune cells are military bases that protect Cell City from damage, and are essentially a cell that specializes in combat. Special forces called 'antibodies' are cultivated in military bases. Antibodies leave the military base and patrol the human body to fight against invaders. In addition to viruses, bacteria, some foreign impurities, and even human cells that have undergone mutation (such as cancer cells, etc.) are all targets of immune cell elimination.

blacklist of immune cells

Immune cells have a ancestral blacklist, which can remember the invaders that have been encountered for a long time. When the invaders appear again, the immune cells can react faster and send out antibodies.

I've gotta PhD collaboration - iGEM Montpellier

Post for Sep. 18th

(IveGottaPhD) | 【Break discrimination and racism : Obstetric Violence】

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Can you imagine that a pregnant woman who is going through labor is being abused by medical professionals? Unbelievable right? Unfortunately, these things actually happened worldwide in different cases. And it is known as the Obstetric Violence. So, what can we do about it? Now, let's look at what team iGEM Montpellier shared with us about obstetric violence.

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Hi! We are team Montpellier participating to the 2020 iGEM competition! We are seven students from France developing a treatment for cancer called Phagent. It targets bacteria that are located in the tumor thanks to phages. The latter are viruses specific to bacteria. That changes bacteria DNA and enables them to attack and kill cancer cells. However our participation to the amazing project 'I've gotta PhD' does not concern cancer. We decided to share information about obstetric violence because, among all medical violences, they are little known and can be very destructive. The international [#metoo](#) trend released words about sexual aggression but it is still taboo and women still feel responsible when the context is medical.

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■ Next Up: 【Mental Health: Chronic Inflammatory Diseases】 ➡ ➡ ➡



I've Gotta PhD

A Worldwide Collaboration by CSMU and NCKU

BREAK DISCRIMINATION AND RACISM



Obstetric violence

Every women can undergo an obstetric violence during her life



OBSTETRIC
FOLLOW-UP



PREGNANCY



BIRTH AND
POSTPARTUM

It concerns different aspects :

- physical
- verbal
- legal

It may take several forms :

- absence of consent
- absence of choice in medical offer
- absence of efficient anesthesia
- no respect of patient rights
- no humanity and dignity

How to fight against ?



The best solution today is to speak about it and share experiences around. It is not enough known yet and lot of women feel responsible for violences they undergo.

As in other medical sectors, violences and discrimination are also colored with racism and homophobia.

I've gotta PhD collaboration - iGEM UCopenhagen

Post for Sep. 22nd

(IveGottaPhD) | 【Mental Health: Chronic Inflammatory Diseases】



Did you know that some diseases can affect our mental health? Such as glaucoma or chronic inflammatory disease (CID). So, check out what iGEM Copenhagen shared about CID and mental health, including their project this year!



This year's iGEM team at the University of Copenhagen consists of students from different academic fields, ranging from nanoscience to philosophy. We are working towards aiding people with chronic inflammatory diseases (CID). This is done by making a yeast-based biosensor that will be placed in a patch and will detect general inflammation through sweat. During the development of our project, it became apparent that people with CIDs not only faced medical problems, but also mental health problems induced by the CID. This article tries to outline how living with a CID can be detrimental for your mental health, and how our product might in turn offer some mental health benefits.



Medical practice and mental health How should we define medical practice? Two potential definitions come to mind. 1) The term “medical practice” describes the meeting between health care professionals and patients, where the goal is to treat and help the individual who is suffering. 2) The term “medical practice” describes the application of medical knowledge to biological organisms in order to understand and alter them. Let us call the first for the person-oriented definition, and the second the biology-oriented definition. Of course, these two definitions are compatible. One can focus on understanding and changing some biological process, while simultaneously caring for the personal well-being of a patient. Conversely, a vital part of alleviating the suffering of a patient is understanding and changing the biological processes causing pain. However, the definitions carry different emphasis. How one puts the emphasis can be important for how one understands what it means to be sick, and how

being sick can severely affect mental health. In order to see this, it is necessary to get somewhat acquainted with the philosophical discipline of Phenomenology.

In short, phenomenology is often described as a return to lived experience. For the phenomenologist, the starting point of inquiry is not the world of science (or theory of any sort), but the world as experienced by an individual. These experiences are inherently meaningful in the sense that someone always has them, and that someone can not help but project meaning onto the objects it perceives. Martin Heidegger illustrates this by talking about the relationship one might have with a hammer. In seeing, or interacting with a hammer, one (usually) does not take the disinterested standpoint of an analyst or scientist. Instead, one takes a more active approach. The hammer is seen as an instrument that serves a purpose. It is seen as something completely atheoretical. Importantly, the hammer is seen as an object laden with meaningful uses. If the hammer were to break, it would cease to be an object laden with meaning. It would become somewhat alien to us, as we fail to see its use.

A key aspect of humans viewing the world as meaningful in this way is that our subjective experiences are always embodied. I do not only have a body, I am a body. My body is my point of view, and the way I experience and understand the world as meaningful is dependent on my body. The way I perceive a hammer as meaningful is dependent on the possible uses my body can make of it. The body is the focal point of all my experiences, and it serves as the necessary background for my experiences to be meaningful.

So, we always view the world as inherently meaningful, and our body is a key component in how the world presents itself as meaningful to us. With that out of the way, we can start to see why the different emphasis in the definitions above is important.

The person-oriented definition emphasizes the suffering of the patient. The goal of medical practice is not primarily to bring some deviant biological organism back to its normal state. Rather, it is alleviating the suffering experienced by a human being. The biology-oriented definition takes a more analytical approach. The primary focus is understanding the underlying biological mechanisms and altering them appropriately.

Let us say that the person-oriented definition focuses on treating a person's illness, while the biology-oriented focuses on treating diseases. Illness is best understood in phenomenological terms. The philosopher Jean-Paul Sartre, while not explicitly

talking about medicine, offers an illustrating example when talking about having a headache. The experience of having a headache is not limited to an isolated feeling of pain. The headache permeates the way I experience the world as meaningful. Sartre describes this as the world becoming “mooded”. The world itself becomes tinted with pain, and the way I am able to interact with it changes. Objects and activities which I would normally find meaningful suddenly have new meanings or ceases to be meaningful all together. For example, under normal conditions, I would view a football as “inviting” me to kick or play with it. When I have a headache, such an object might not present itself to me as meaningful at all. Illness describes the deviation of how we normally experience the world as consisting of meaningful objects and activities.

The biology-oriented definition of medical practice focuses on treating diseases. As mentioned, this amounts to viewing the problem as some kind of biological process which has malfunctioned. The subject, and its experiences, do not feature in treating a disease. Foucault famously called this the “medical gaze”. The medical gaze describes the tendency of medical practice to take the disease, and not the person, as the object to be investigated.

This article is about mental health. So far, we have not touched on this issue. The reason for the long preamble is that I want to argue that only focusing on treating an individual’s disease potentially neglects a range of issues regarding their illness. Issues that are important for the mental well-being of people suffering from some disease.

This year’s iGEM team at the University of Copenhagen is focusing on helping people with chronic inflammatory diseases (CID). We are producing a yeast-based biosensor that will be placed in a patch and will detect inflammation levels in sweat. We hope to replace invasive tests, and reduce the need for CID patients to visit hospitals. The product is designed to make tailoring medication dosage and type to the patient easier. Hopefully, this will make for more effective treatment of CID patients given that the ability to discover inflammation spikes quickly and react accordingly should be a great medical tool.

Often, when we at the team talk about the benefits of our product, we implicitly adopt the biology-oriented definition of medical practice, and as a consequence see the product as targeting a disease. However, another benefit is how such a product might treat the illness of a person. Living with a CID is not only having part of your

biological organism being permanently deviant (i.e a disease), it can also be a permanent state of perceiving the world as “mooded”. Arguably, living with a CID can change how one experiences the world as meaningful.

Foucault argues that the medical gaze permeates all of medical practice. A consequence of this is that the clinical jargon associated with the gaze is not confined to academic discussion among experts. Instead, it spills over to how the patient views their predicament. The patient can start to view their situation as a consequence of certain biological processes that are completely detached from their subject. If we analyze this from a phenomenological view, we could argue that the disease causes a loss in autonomy for the person. The disease comes to be viewed as an alien force partially taking control of the person’s will and desire.

In psychological terms, one might claim that the medical gaze limits the patient’s ability to cope. Reportedly, people who are diagnosed with CIDs are more likely to subsequently undergo episodes of depression, anxiety, and generalized distress (Taylor, 2016, p. 641). Furthermore, denial is often an immediate response for patients diagnosed with CIDs. Patients act as if the disease is not severe, and that it will shortly go away (Taylor, 2016, p. 641). This can be understood as a refusal to acknowledge that the chronic nature of the disease translates into chronic effects on the illness. The disease can have monumental and lasting effects on the patient’s body image and self-worth. Treating one’s illness amounts to minimizing the effects a disease has on how one perceives the world as meaningful, and when that is not possible, accommodating the disease into a new autonomous way of living.

An Australian study interviewing patients with diabetes and cardiovascular disease highlights the importance of autonomy. Some patients felt that their disease came to be at the center of their lives, forcing them to prioritize certain activities and placing boundaries on what they could do (Warren et al, 2012, p. 329). The monitoring and treatment regimens patients were placed under often felt invasive and disruptive. One patient, Judith, felt that her life was out of her control. According to the article “She resented the doctor imposing restrictions on her, rather than working with her to develop strategies to manage her weight and thus, her diabetes” (Warren et al, 2012, p. 329). This fits well with the view that certain illnesses can alter the way we experience the world as meaningful.

Patients also reported some of the measures taken by themselves to regain control of their lives. This included taking an active interest in how one was treated (such as

trying out alternative medicine), and an emphasis on managing stress (by meditation, Yoga, Tai Chi, etc.). Patients reported that when taking direct action regarding their disease they were able to bring normalcy and order to their lives (Warren et al, 2012, p. 331). Again, this fits well with the phenomenological view on illness. The reported distress from the patients was not grounded in displeasure about the efficacy of the biomedical treatment of their disease. Rather, the displeasure was grounded in how their treatment plan failed to address their illness.

“Patient empowerment” is a buzzword often heard in CID communities. According to one interview we did with Norwegian Rheumatoid association, patients often have a desire to take direct control of their disease by changing their diet, exercise, or by the type of activities mentioned above. Such attempts at self-empowerment can be seen as a refusal to let the disease translate into an illness. Only when patients introduce active measures of control into their lives, are they able to return to a state of “normalcy”.

Hopefully, our product can be used as a tool for such a return to normalcy. CID patients are subject to frequent testing and comprehensive treatment plans. Naturally, these treatment plans primarily focus on treating the disease. By introducing a home testing device for inflammation we can hopefully give some control back to CID patients. As a result treatment plans can hopefully better be structured and tailored to how the patient wants to live their life. As a result, the disease can come to be seen less as a foreign intrusion dictating how one lives life. We hope that our device can aid CID patients in accommodating their illness into a new meaningful way to experience the world.

Sources

McGraw-Hill (2016) Management of chronic health disorders. In “Medical and health Psychology 10th edition”. New York.

Warren, N., Canaway, R., Unantenne, N., & Manderson, L. (2013). Taking control: Complementary and alternative medicine in diabetes and cardiovascular disease management. *Health*., 17(4), 323-339.



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email: phdigem2020@gmail.com

Instagram: @igem_csmu @igemncku

■ Next Up: 【Basic Health Care: iGEM Patras】 ➡➡➡

#IveGottaPhD #iGEM #igemUCopenhagen #igemCSMU #igemNCKU



I've gotta PhD collaboration - iGEM Patras

Post for Sep. 24th

(IveGottaPhD) | **【Basic Health Care: iGEM Patras】**



Health will always be a priority throughout our lives, both physical and mental health. What are the things that we can do to maintain our health? In today's post, iGEM Patras will share some simple actions to maintain your physical and mental health. Let's check out their poster!



Maintaining your mental and physical health can be a daunting task. Here, we are presenting you some health care tips that everyone should follow in everyday life. These health benefits, not only maintain your mental and physical health, but they also work to prevent illnesses, some of which can be very serious. While it may seem like a challenge, making the effort to maintain your mental and physical health has many benefits in the long run. We choose this topic for presentation because our team, which consists of many students who study at the Faculty of Health Science, believe that if you don't regularly make health a priority, the journey to health can seem like a steep, uphill battle. Also our project based in health and especially it is in the diagnostic projects category.








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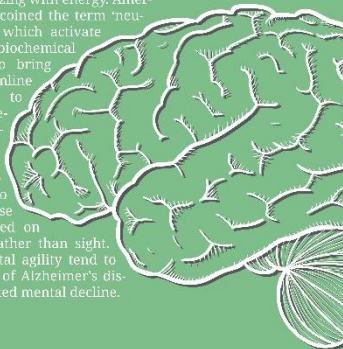
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■ Next Up: **【Mental Health: Inflammatory Bowel Disease】** ➡➡➡

<h3>1. Wash your Hands</h3> <p>You can help yourself and your loved ones stay healthy by washing your hands often, especially during these key times when you are likely to get and spread germs:</p> <ul style="list-style-type: none"> Before and after preparing and eating food Before and after caring for someone at home who is sick Before and after treating a cut or wound After using the toilet After blowing your nose, coughing, or sneezing After touching an animal, animal feed, or animal waste After touching garbage 	<h3>2. Nasal Wash</h3> <p>A nasal wash is a way to clean the nasal passages and sinus cavities. It's a simple procedure that most people, even children, can do easily.</p> <p>Benefits of a Nasal Wash</p> <ul style="list-style-type: none"> Reduces allergies by removing allergenic particles Removes bacteria and viruses to decrease infections Removes mucus so nasal medications work better Reduces nasal swelling and increases airflow Reduces dryness and irritation 	<h3>3. Do self-checks.</h3> <p>Do regular self-examinations of your breasts. Most partners are more than happy to help, not just because breast cancer is the most common cancer among SA women. The best time to examine your breasts is in the week after your period.</p> 	<h3>4. Copy your kitty</h3> <p>Learn to do stretching exercises when you wake up. It boosts circulation and digestion, and eases back pain.</p> 	<h3>5. Neurobics for your mind</h3> <p>Do your brain buster with neurobics. Neurobics are exercises that use the brain very often. They also affect your body. Neurobics are simple exercises that you can do anywhere, anytime. They are simple, easy to learn, and can be done by anyone. They are simple, easy to learn, and can be done by anyone. They are simple, easy to learn, and can be done by anyone.</p> 
<h3>6. Bone up daily.</h3> <p>Get your daily calcium. The average adult needs 1,000 mg of calcium a day. You can get it from food or supplements. If you're not getting enough, you might want to consider a supplement. If you're not getting enough, you might want to consider a supplement. If you're not getting enough, you might want to consider a supplement.</p> 	<h3>7. Prevention</h3> <p>Help prevent sexual cancer. Sexual cancer is a type of cancer that affects the reproductive system. It can be prevented by using condoms, getting regular checkups, and avoiding risky sexual behavior. If you're not getting enough, you might want to consider a supplement. If you're not getting enough, you might want to consider a supplement. If you're not getting enough, you might want to consider a supplement.</p> 	<h3>8. Sun protect</h3> <p>Don't let the sun get to you. The sun is a powerful force, and it can cause skin cancer. You can protect yourself by wearing sunscreen, wearing a hat, and avoiding the sun during peak hours. If you're not getting enough, you might want to consider a supplement. If you're not getting enough, you might want to consider a supplement. If you're not getting enough, you might want to consider a supplement.</p> 	<h3>9. Care for minor wounds</h3> <p>Take care of your skin. Minor wounds can be treated at home. You can clean the wound, apply a bandage, and keep it dry. If you're not getting enough, you might want to consider a supplement. If you're not getting enough, you might want to consider a supplement. If you're not getting enough, you might want to consider a supplement.</p> 	<h3>10. Health insurance</h3> <p>Get your health insurance. Health insurance is a way to protect your health. It can cover the cost of medical care, hospitalization, and more. If you're not getting enough, you might want to consider a supplement. If you're not getting enough, you might want to consider a supplement. If you're not getting enough, you might want to consider a supplement.</p> 

5. Neurobics for your mind

Get your brain fizzing with energy. American researchers coined the term 'neurobics' for tasks which activate the brain's own biochemical pathways and to bring new pathways online that can help to strengthen or preserve brain circuits. Brush your teeth with your 'other' hand, take a new route to work or choose your clothes based on sense of touch rather than sight. People with mental agility tend to have lower rates of Alzheimer's disease and age-related mental decline.



6. Bone up daily.

Get your daily calcium by popping a tab, chugging milk or eating yoghurt. It'll keep your bones strong. Remember that your bone density declines after the age of 30. You need at least 200 milligrams daily, which you should combine with magnesium, or it simply won't be absorbed.



7. Prevention

Help prevent sexually transmitted infections (STIs) and HIV/AIDS by using condoms every time you have sexual contact. Condoms aren't 100 percent foolproof, so discuss STI screening with your provider. Birth control methods other than condoms, such as pills and implants, won't protect you from STIs or HIV.



8. Sun protect

Stay out of the sun, especially between 10 a.m. and 3 p.m. when the sun's harmful rays are strongest. You are not protected if it is cloudy or if you are in the water — harmful rays pass through both. Use a broad spectrum sunscreen that guards against both UVA and UVB rays, with a sun protection factor (SPF) of 15 or higher. Select sunglasses that block 99 to 100 percent of the sun's rays.



9. Care for minor wounds

First, wash and disinfect the wound to remove all dirt and debris. Use direct pressure and elevation to control bleeding and swelling. When wrapping the wound, always use a sterile dressing or bandage. Very minor wounds may heal without a bandage. You'll need to keep the wound clean and dry for five days. You should also make sure you get plenty of rest. Pain typically accompanies a wound. You can take acetaminophen (Tylenol) as directed on the package. Avoid products with aspirin since they can cause or prolong bleeding. Apply ice if you have bruising or swelling, and avoid picking at scabs. If you're spending time outdoors, use a sunscreen that's sun protection factor (SPF) 30 on the area until it's completely healed.



10. Health insurance

- Ask questions
- Keep a list of all the medicines you are taking
- Confirm what will happen before your operation or other procedure
- Ask about your care when you leave hospital
- Know your rights



I've gotta PhD collaboration - iGEM Thessaly

Post for Oct. 3rd

(IveGottaPhD) | **【Mental Health: Inflammatory Bowel Disease】**



Sometimes, when we are feeling down, a simple word of encouragement will be helping. Then, let's check out the colorful poster that iGEM Thessaly made! You can share the poster with your loved ones and help to raise mental health awareness. And don't forget to scan the QR code to know more about iGEM Thessaly.



Hello everyone, we are iGEM Thessaly, which consists of twelve undergraduate and overgraduate students, from the University of Thessaly, coming from the fields of Biology, Architecture, and Computer Science.

Our work focuses on Inflammatory Bowel Disease (IBD), particularly in Crohn's disease and Ulcerative colitis (UC). Inflammatory Bowel Disease involves a group of inflammatory conditions causing infections in the gastrointestinal tract, resulting in its malfunction and in the consequent lack of nutrients. Our project called Amalthea from a Greek myth in ancient times. Amalthea was a she-goat nurse of the god Zeus who nourished him with milk in a cave. The goal is to create a bacterial supplement that will assist the patient's nutrition.

IBD includes a group of autoimmune diseases, and thus it is considered a chronic disease. An autoimmune disease can be an essential fingerprint for a patient.

Unfortunately, most people in our country, Greece, tend to hide their condition due to the fear of pitifulness and society's lack of affection and understanding.

So, we decided to design a poster to boost people's morale. We can help raise mental health awareness but also increase the self-confidence of people who suffer from it.



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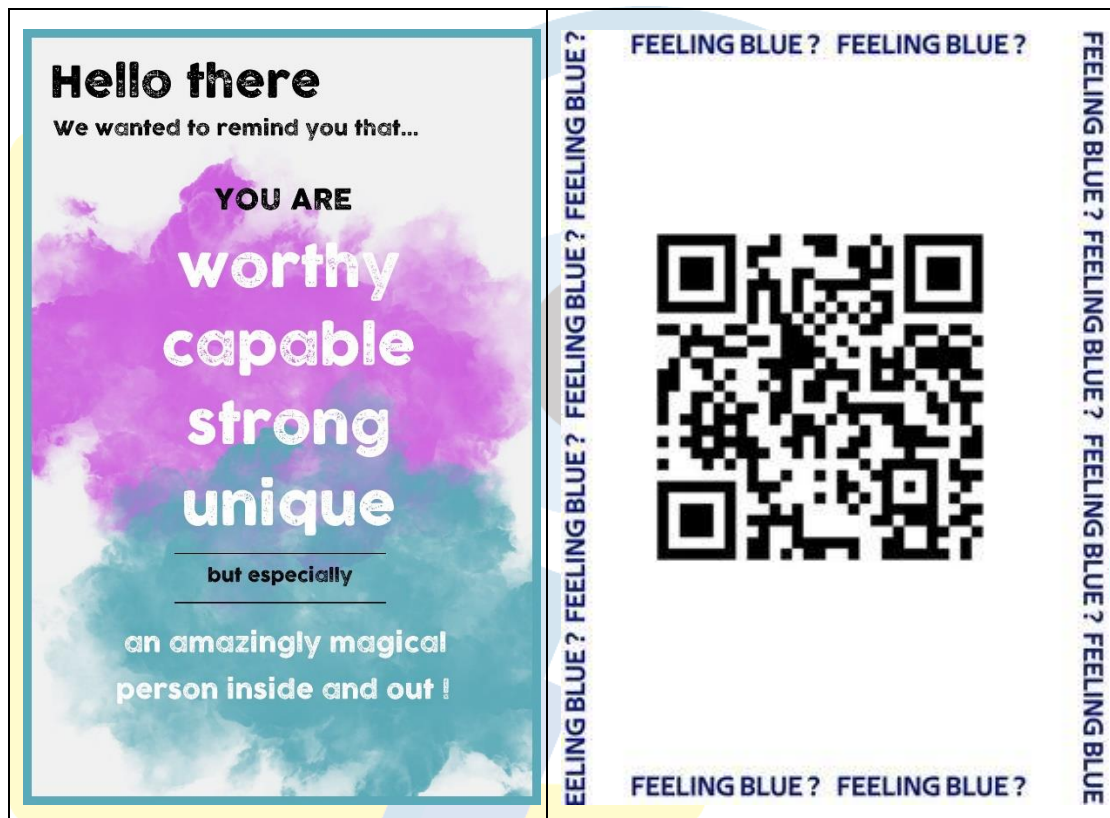
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email: phdigem2020@gmail.com

Instagram: @igem_csmu @igemncku

Next Up: 【Science communication : Dengue virus】 ➡➡➡

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I've gotta PhD collaboration - iGEM CCU_Taiwan

Post for Sep. Oct. 5th

(IveGottaPhD) | 【Science Communication : Dengue Fever】

◇◆◇

Health science communication is essential to control diseases such as dengue fever. Dengue fever has been a global pandemic since the WW2. However, as technology advances, why dengue fever is still an global issue? In this post, let's see what iGEM CCU brought to us about dengue fever.

◇◆◇

WHO listed dengue as a potential threat among ten diseases. Why is dengue a global issue? How serious is dengue? It is important for Taiwanese under the threat of an epidemic area to focus on the issue.

CCU_Taiwan is working on developing a new dengue virus detection kit to increase the detection capacity in Taiwan and other high-risk areas in the world.

CCU_Taiwan is an interdisciplinary team composed of fourteen passionate students having a different professional background from eight departments.

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Next Up: 【Basic Health Care: iGEM Peru】 ➡➡➡

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What is Dengue Fever ?

Dengue fever, commonly known as "tengu fever" or "broken bone fever", is an acute infectious disease infected by the bite of a vector mosquito.

It mainly presents symptoms such as fever, rash, and musculoskeletal pain.



Dengue infections are caused by four closely related viruses named DEN-1, DEN-2, DEN-3, and DEN-4. These four viruses are called serotypes because each has different interactions with the antibodies in serum.



The mosquito becomes infected when it bites a person with dengue virus in their blood.

It can't be spread directly from one person to another person.



Dengue fever in Taiwan are transmitted by the bites of infected *Aedes Aegypti* and *Aedes Albopictus* mosquitoes.



1

Affected Area
Tropical area
Subtropical area
129 countries
3.9 billion people at risk
390 million infections every year



2

The incubation period of dengue fever is 3-14 days.



3

Dengue fever can be classified into typical dengue fever, dengue hemorrhagic fever and dengue shock syndrome based on the periods that occur after virus invasion.

Dengue shock syndrome

Without proper treatment, the mortality rate can be as high as 40%.

Dengue hemorrhagic fever

Without proper treatment, the mortality rate can reach 10-20%.

Typical dengue fever



No Effective Treatment for Dengue Fever

why



Cytokine Storm

When the virus binds to the CLEC5A on the surface of macrophages, it enters the cell. Then, when another serotype dengue virus enters, the antibodies in turn assisting the virus invasion is called **antibody dependent enhancement (ADE)**. When the virus spreads in the macrophages, other macrophages secrete more cytokines, and cause a **cytokine storm**, which will cause **dengue hemorrhagic fever** or **dengue shock syndrome** with a high fatality rate.

Dengue virus is divided into four serotypes. Despite the fact that patients have been infected with a certain serotype of virus, they can be immune to this type of virus for life. However, they do not have immunity to other types.



At present, there is no effective vaccine or specific medicine to prevent dengue fever. Thus, the most effective way to control the density of vector mosquitoes is to remove water containers to prevent vector mosquito breeding.



I've gotta PhD collaboration - iGEM UPCH_Peru

Post for Sep. Oct. 7th

(IveGottaPhD) | 【Basic Health Care: iGEM UPCH_Peru】



When you go to a fancy steak restaurant or having a BBQ party, how well would you like the meat to be done? Rare? Medium-rare or medium? However, did you know that eating raw or uncooked meat may cause a severe parasite infection called *T. solium*. In this post, iGEM UPCH Peru will share more about this parasite and how to prevent them! So, make sure to check it out!



》 Ourself Short Introduction

We are iGEM UPCH Peru, a multidisciplinary team that plans to use using synthetic biology to solve problems related to agriculture in our country. However, we are also aware of the health problems that our community presents.

》 Background

A serious public health problem is the widespread zoonosis caused by *Taenia solium* in various regions of Peru. This endemic cestode infects pigs and humans, and persists as an infectious agent in the agriculture and livestock industry. Taeniasis and neurocysticercosis are diseases caused by different stages of development of this parasite, but both are due to the lack of health education, especially in the poorest sectors of the country.

》 Description

Since these diseases are easily preventable, we believe it is important to share the following prophylactic measures for both the community and the corresponding authorities:

- Avoid eating raw or undercooked pork, because the larval stage of the parasite remains there.
- Always wash your hands after using the bathroom and before preparing food, since the parasite eggs are released in the feces of infected people.
- Establish better sanitary controls in pig farms.
- Provide health education and improve the sanitary conditions of the affected areas.

》 Credits:

Text: Valeria Villar, Biologist
Post design: Isabel Ruiz, Biologist
Vectors: Biorender, Freepik & Dribbble
» Our Social Media
Facebook: Crioprot UPCH iGEM 2020
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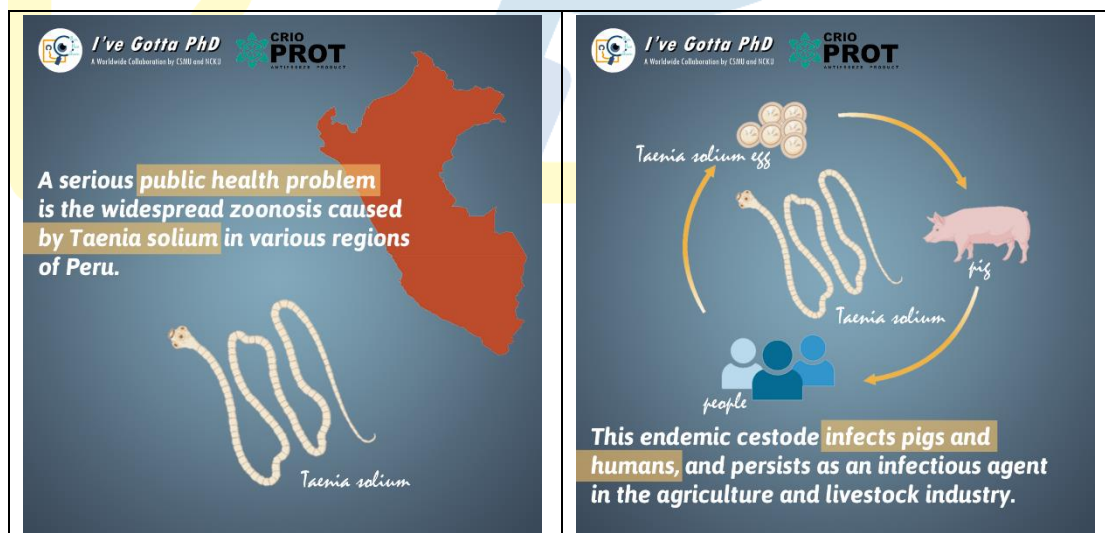
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Next Up: 【Mental Health: iGEM UPCH_Peru】 ➡➡➡

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A Worldwide Collaboration by CSIRO and HCCO

**CRIO
PROT**
COMMUNITY PROTECT

Taeniasis and neurocysticercosis are diseases caused by different stages in the development of this parasite,



but both are due to the **lack of health education**, especially in the poorest sectors of the country.



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**CRIO
PROT**
COMMUNITY PROTECT

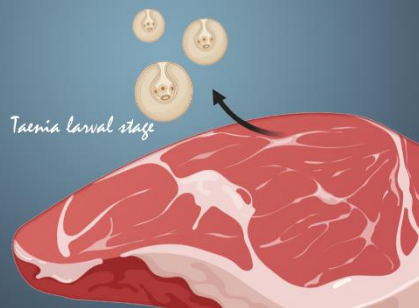
Since these diseases are easily preventable, we believe it is important to share the following prophylactic measures for both the community and the corresponding authorities:



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**CRIO
PROT**
COMMUNITY PROTECT

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A Worldwide Collaboration by CSIRO and HCCO

**CRIO
PROT**
COMMUNITY PROTECT

Always wash your hands after using the bathroom and before preparing food, since the parasite eggs are released in the feces of infected people.



I've Gotta PhD
A Worldwide Collaboration by CSIRO and HCCO

**CRIO
PROT**
COMMUNITY PROTECT

Establish better sanitary controls in pig farms.



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A Worldwide Collaboration by CSIRO and HCCO

**CRIO
PROT**
COMMUNITY PROTECT

Provide health education and improve the sanitary conditions of the affected areas.



Post for Sep. Oct. 11st

(IveGottaPhD) | 【Basic Health Care: iGEM UPCH_Peru】



It's iGEM UPCH Peru again! This time, they made a poster of mental health awareness to remind us of the importance of mental health is the same as physical health. Let's check 'em out!



》 Ourself Short description

We are iGEM UPCH Peru, a multidisciplinary team that plans to use using synthetic biology to solve problems related to agriculture in our country. However, we are also aware that mental health is essential for our wellbeing.

》 Background

Around the world, 450 million people are affected by a mental health problem that seriously hinders life, about 800,000 people commit suicide annually and it has become the second cause of death, and 1 in 4 people have a mental disorder throughout his life. These numbers show mental health today, and in turn, this reflects the work that must be done to deepen greater prevention work.

》 Description

Mental health is often underestimated, since it is not taken into account that it can have effects at the same level as is usually seen with physical health. The problem is that it is taken as divided and the union of mind-body is ignored, which makes up integral health. A change must be generated in order to normalize the presentation of mental health problems, it also should destigmatize everything that encompasses mental health and finally, prevent and promote the necessary care for good mental health.

Based on the above, it is considered relevant and necessary to work on mental health issues. For this reason, the inspiration to develop more about mental health focuses on psychoeducation of society and in this way informs about it.

》 Credits:

Text: Elizabeth Sanchez, Psychologist

Post design: Isabel Ruiz, Biologist

Vectors: Freepik

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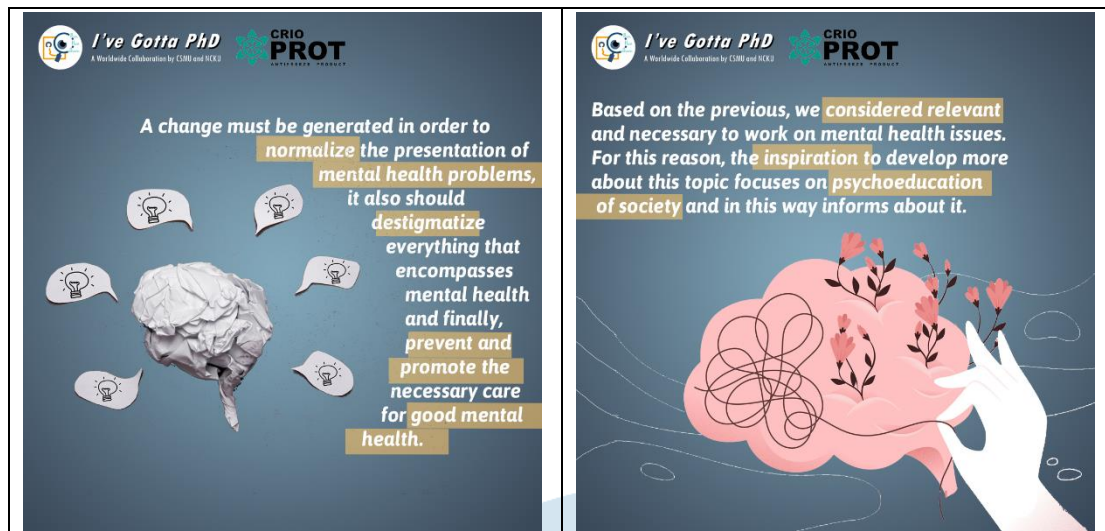
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■ Next Up: 【Mental Health: iGEM NYMU_Taipei】 ➡ ➡ ➡

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I've gotta PhD collaboration - iGEM NYMU_Taipei

Post for Sep. Oct. 13rd

(IveGottaPhD) | 【Break Discrimination and Racism: Although having Asia faces, the Chinese are still human beings! --the phenomenon of discrimination against the Chinese during COVID-19 pandemic】

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COVID-19 has deeply influenced every corner of our daily lives since the end of 2019. This time, NYMU_Taipei pointed out the serious discrimination problem owing to this pandemic and wrote an article in the hope of urging everyone to treat one another equally regardless of the race. Let's check out their contribution!

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iGEM 2020 NYMU-Taipei says hello to everyone. Due to the serious pandemic of COVID-19, this year, we try hard to tackle the problem in a much more elementary approach. By utilizing the nature of strong binding interactions between hACE2 and the spike of SARS-CoV-2, we deeply believe that we would be able to reap the benefits of viral evolution. In order to achieve our goals, we engineered a protein construct that includes the hACE2 receptor binding domain, a linker, and a protease that is specific at cleaving spike proteins. The protein construct functions as a capture device and can be implemented on many occasions, such as masks, contact lenses, and even filtration devices, as a mean to capture, destroy, and even quantify the amount of virus particles on a particular surface, so as to reduce the number of SARS-CoV-2 and, moreover, decline the possibility of infection on human beings.

Through the ages, racial discrimination is consistently a significant issue. Even nowadays, more or less, violent debates between colors still exist as before in modern era. Until now, there is still no appropriate solution to this issue, no matter how fancy the world is. To make matters worse, due to the eruption of COVID-19, the problem has become more and more serious recently especially for Chinese people, which then results in social contradictions under the pandemic.

Currently, COVID-19 have already taken over million lives globally. In the beginning, the virus was found in Wuhan, China. It, however, has become a worldwide disaster in a short term. The president of the United States, Donald Trump even called SARS-CoV-2 a 'Chinese virus'. In the meantime, particularly in Western

areas, the Chinese become obvious targets. In other words, the status of being Chinese put them at a risk of discrimination, which then contributes to incredible impact on their lives.

According to Human Rights Watch (HRW), report on 17.04.2020 revealed that in just a few months, over 1000 cases of discrimination against the Chinese had been recorded. The Federal Bureau of Investigation (FBI) also delivered a warning that, during the pandemic, crime rates concerning assault on Chinese people may elevate rapidly. Those who assaulted Chinese people claim that individuals with yellow skin are virus transmitters and that since Chinese could carry the virus, they should all leave the western country. Some even go as far as to say that the Chinese should not have the same rights to live a normal life. Under these situations, an unspoken rule that is followed in those precarious areas is: 'Individuals, who look like Chinese, should be attacked.'

The discrimination not only manifests in physical aggression but also verbal form, which is also the more common way. Examples include swearing and demands to leave shops. Among the discriminated, women are even more often the subjects of this kind of treatment. Given these situations, Chinese are often unwelcomed in many places. Just because of their ethnic backgrounds, hotels and even Uber drivers would reject services to the Chinese. A radio program in Holland even aired the track: 'Voorkomen is beter dan Chinezen', appealing the public masses to keep distance to the Chinese. In addition, face masks itself is already a hot topic, but to make matters worse, this topic is also commonly used in discrimination among Chinese people. Chinese People with masks will be assumed as infected while the ones without mask will be assumed as being careless virus transmitters.

Being stigmatized as virus transmitters, the Chinese, due to fear of being attacked even further, advocate for change. They have established a team called 'Asian Gambling SOS' which aims to make connections between communities closer and stronger. Moreover, Jason Chu, an American-Born Chinese, wrote a rap song declaring that the Chinese living in western areas are not terrorist. They are just people who live there and that those places may be their 'only' home. It is just so ignorant and ridiculous to discriminate directly against all Chinese people. In conclusion, although having Asia faces, the Chinese are still human beings.



■ Feel free to contact us for more information:

Facebook: I've Gotta PhD (<https://www.facebook.com/Ive-gotta-PhD-105826301230041/>)

email: phdigem2020@gmail.com

Instagram: @igem_csmu @igemncku

■ Next Up: 【Thanks for your participation!】 ➡➡➡➡

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[Break Discrimination and Racism: Although having Asia faces, the Chinese are still human beings! --the phenomenon of discrimination against the Chinese during COVID-19 pandemic]

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Post for Sep. Oct. 21st

(IveGottaPhD) | 【iGEM CSMU X NCKU 2020 – Oral Cancer & Glaucoma】

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Hello there, to officially ended I've Gotta PhD, we, iGEM CSMU Taiwan and NCKU Tainan, have also made posts regarding each team project, which are oral cancer and glaucoma. Let's check out this last post together, and thank you for the love and support to I've Gotta PhD.

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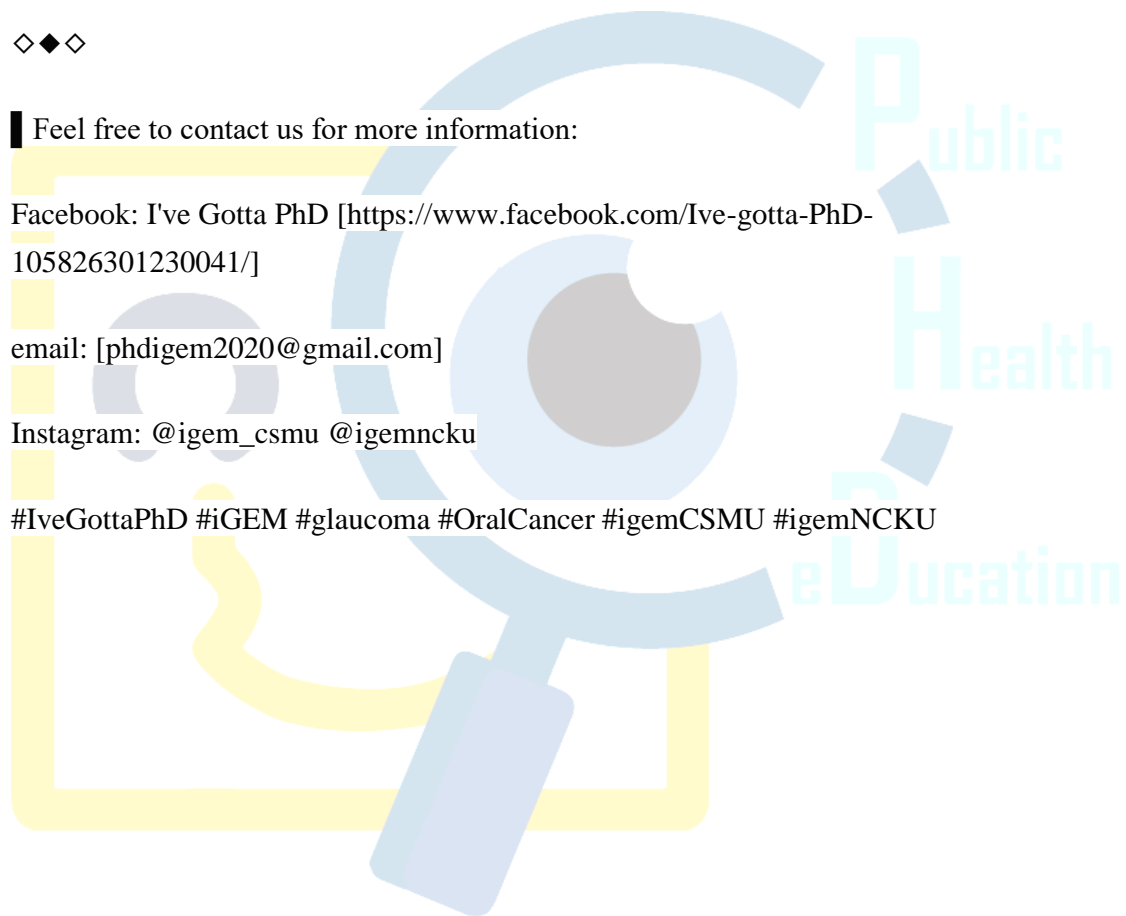
Feel free to contact us for more information:

Facebook: I've Gotta PhD [<https://www.facebook.com/Ive-gotta-PhD-105826301230041/>]

email: [phdigem2020@gmail.com]

Instagram: @igem_csmu @igemncku

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CSMU Submission

Science communication

To talk about oral cancer, we have to know what it is first. According to WHO and FDI World Dental Federation, oral cancer is all malignancies arising in the soft tissues of the lip, tongue and elsewhere in the oral mucous membranes. It's the eighth most common cancer in the world. And in Taiwan, oral cancer accounts for the fourth-highest incidence of malignancy in males and the seventh highest in the general population of Taiwan. The relatively high prevalence of oral cancer is mainly because a high-risk group of the community exists, who exhibit habits of betel nut chewing. Oral cancer is having high cure rates when detected early and treated according to best practices. However, the current detection method is biased and there are some problems that are hard to be solved. The current method of detecting oral cancer is dependent on inspection and biopsy. The inspection may vary a lot according to the dentist or ENT doctors' experiences. Thus this year, iGEM_CSMU is working on creating a non-invasive, quantitative, and accessible method for oral cancer detection.

Basic health care

Oral cancer patients may need ongoing reconstructive surgery and chemotherapy, which might cause some side-effects. So here are the most common side-effects:

- Sore Mouth: This can last for several weeks. Patients have to use special mouthwashes and painkillers. They are avoiding hot drinks and spicy food.
- Dry Mouth: The treatment damages the saliva glands so that the patients produce less saliva than usual. What they can do is to suck crushing ice and to chew gum to help stimulate the saliva glands.
- Difficulty Swallowing: At first, they might need a feeding tube to help receive correct and enough nutrition. Carrying on the swallowing exercises is essential as well. The aid from a speech therapist enables the patients to recover better.
- Infection: Chemotherapy can make patients more prone to infection. Therefore, the correct cleaning method turns out to be essential. Since the

mouths of the patients are vulnerable, they have to switch from regular toothbrushes to softer ones like sponge swabs.

Research

Oral cancer has been proved that it has high cure rates when detected early. The detection method nowadays is mainly dependent on inspection, observing if there are any symptoms like a white and red patch. When the lesions are observed, those patients will be referred for a biopsy to confirm its malignancy. However, this kind of current detection method is biased; the results may vary a lot according to different people conducting the process. Therefore, scientists have considered a lot of samples and been searching for some biomarkers. For example, microRNA, which has been proved that can distinguish different stages of OPMD and OSCC from healthy patients, especially microRNA 21, 31, and 146. miRNA 21 possesses the ability to distinguish the early stage of OPMD, while miRNA 31 enables one to distinguish the late stage of transformative OPMD from healthy patients.

Knowing these three are the useful biomarkers to detect oral cancer, to figure it out how to detect them becomes explicitly crucial. And that's what iGEM CSMU 2020 is doing right now.

International healthcare organization

There are some international organizations that are working on oral cancer, including the International Agency for Research on Cancer, Oral Health Foundation and so on. International Agency to Research on Cancer is the organization form part of the World Health Organization. It conducts and coordinates research into the causes of cancer. It also collects and publishes data regarding the occurrence of cancer worldwide. Oral Health Foundation is a non-profit charity, dedicating to improve oral health and welfare around the world. Except for those international organizations, Taiwan also has many health care organizations and foundations. For instance, Health Promotion Administration (HPH) which provides free screening, Sunshine

Social Welfare Foundation, which provides not only services but also support to oral cancer survivors.

NCKU submissions

Mental Health

Visual Impairment and Mental Health

Can you imagine knowing the possibility of you going blind? Imagine that you are diagnosed with eye disease at a young age. And it might result in blindness after a few years. Imagine going back and forth to the hospital for treatment. How would you feel during that time?

Various studies show that blindness and mental health can come hand-in-hand. Whether it's a sudden loss of eyesight or acquired blindness, it can co-occur with mental disorders such as anxiety, depression, panic attacks, Post Traumatic Stress Disorder (PTSD), and even suicidal thoughts. Moreover, people diagnosed with vision loss are likely twice to suffer from depression.

According to the Royal National Institute of Blind People, only 17% of people experiencing vision loss are offered emotional support in response to their deteriorating vision.

Here are some things we can do to support someone with visual impairment:

1. Try to open up their feelings in a gentle way. Don't ever force them to open up their feelings because it takes time to do so. At the same time, keep on supporting them. Because studies show that, by channeling or opening up the feeling inside, it helps massively.
2. Doing sports, it's a fact that by doing physical activities, including sports, can help to boost self-esteem or self-acceptance, as well as improve physical, mental, and emotional health.
3. Seek help from professionals.

However, until now, there are still no specific ways to support people with this kind of situation. More should be done to improve the ways to support people with visual impairment. By sharing this, we hope it can help to raise the awareness around mental health issues affecting the blind.

Discrimination

Discrimination is the act of making distinctions between human beings, based on the groups, classes, or other categories to which they are perceived to belong, rather than personal characteristics. Among them, the most troublesome is the unintentional discrimination, and for the visually impaired, it is the most common discrimination in Taiwan.

Unintentional discrimination usually comes from preconceived notions. Discriminators may not realize that they are discriminating, or even mistake discrimination as goodwill to others. For example, in a judicial case in Taiwan, the defendant got into a car accident and damaged his brain, leading to a visual impairment called Cortical Visual Impairment (CVI). He can only distinguish things in the form of a color block by the remaining light and color perception in the brain. Although he can still read and write a paper, or, catch a frisbee, he has been confirmed by a lot of hospitals that his vision is less than 0.01. Even so, the judge still stated that the defendant could read, write papers, and catch a frisbee, which violated the general perception of the visually impaired. Moreover, the judge even stated that the defendant had normal vision and had to repay 5.22 million insurance money. Another example is the layout of the bank's barrier-free APP. To prevent the visually impaired from accidentally touching other functions, they streamlined the layout and removed many necessary functions, which only made the visually impaired more difficult to manage finances. Moreover, visually impaired people are not like what the bank believes. They are more careful than ordinary people when operating. Assuming that they are "incompetent" to deal with everything is unintended discrimination.

To prevent this kind of discrimination, the most fundamental way is to understand the root of this matter. Take the example of the judge's decision. The judge should have a comprehensive understanding of CVI before making a decision, rather than through his existing knowledge. Another way is to consult with those who have something to do with the issue. For example, before changing the layout of the bank's barrier-free APP, they should discuss with people who are familiar with visual impairment. As for the general public, knowing that "blindness" and "disability" aren't equal in mind is the most important thing to do. We hope that through this article, everyone can learn

more about visually impaired and how to minimize discrimination. Let's make the world a better place!

Policies

The policy of a country determines the development of the country in each field. Good policies can create a good development environment, but bad policies can lead to stagnant development. In this article, we want to talk about the visually impaired policies in Taiwan and explore what kind of environment the Taiwan government has created for them in recent years.

Since 1871, Taiwan began to improve the lives of the visually impaired. The first school for the blind was founded by a British pastor, William Campbell (the pioneer of education for the blind in Taiwan). With the help of a church, courses such as Braille, accounting, and handcrafts were conducted. Then, in 1900 (the Japanese colonial period), with the help of the Japanese government, the scale of education for the visually impaired was expanded, and the Japanese traditional massage industry was introduced. Not only that, but William Campbell also integrated acupuncture and moxibustion to strengthen the public's willingness to accept this new industry.

By 1923, the number of visually impaired people engaged in massage and acupuncture services in Taiwan had reached 440, and they were able to earn a good income. The concept of massage for the blind was also deeply rooted in the hearts of the people. This provides an important way for the visually impaired to earn a living, but it also limits the development of the visually impaired in other areas. Then, in 1950, the introduction of physical therapy, mechanical automation, and the reform of medical law made the situation worse. Among them, the restriction of the medical law-that people with physical disabilities should be listed as "unqualified" to prohibit practicing medicine is the most serious blow. It directly prohibits the visually impaired from using acupuncture or electrotherapy, etc., to make a living by using substantive medical methods. The only massage is restricted by the relevant laws of the "Law on the Protection of Persons with Disabilities" that "persons who are not visually impaired as referred to in this law shall not engage in the massage." However, this was not a decision made for the visually impaired, and it also caused an unfair situation to the remaining vulnerable. Therefore, the law was repealed in 2006.

Up to now, the government still has not put forward an effective policy to help the visually impaired. Taiwan needs improvement in this situation. Let's take a look at what other countries do. Germany, the United States, and Japan all encourage the visually impaired to take up legal-related jobs. They provide special tutorials and training for them. In the United Kingdom and France, there are many diverse occupations for the visually impaired. However, in Taiwan, not only did the lawyer job isn't available for them, but the employment rate for the visually impaired was nearly five times lower too. But, in other countries, such as the UK or the US, they don't have a complete law either, the employment rate of the visually impaired is still low, mainly due to the narrow education and unfriendly workplace.

We believe Taiwan can start from these points. First, open more courses related to other occupations, and increase the public acceptance of visually impaired people in general education. This requires long-term and stable planning and implementation. Second, the not supportive workplace, the barrier-free passages, the laying of guide bricks, or various assisting devices for the visually impaired, requires companies to improve, and the government itself needs to implement more.

We hope this article can help to raise public awareness of these problems to change the existing plight of the visually impaired. Let's make the world a better place!