Background

LGBTTTQQIAA (Lesbian Gay Bisexual Transgender Transsexual Two-Spirit Queer Questioning Intersex Asexual Ally), or LGBTQ+, inherently affects 1~3% of the global population. Social proceedings of LGBTQ+ communities were observed recently, in part due to the radical uprising of Generation Z via the exploitation of social media. Hence, to a considerable extent, rights of LGBTQ+ identifying personnel and conscious/unconscious bias accompanying have been gradually corrected, as the educational system and digital media define understanding LGBTQ+ to a hallmark of Generation Z.

Nonetheless, the LGBTQ+ community still fails to settle grounds for suitable validation and accreditation in STEM: lack of representation and disproportionately negative effects towards this social cohort persist, relatively severe when compared to other underrepresented factions of STEM, such as the Latin community, American Indian community, et cetera. Most studies suggest that both conscious and unconscious educational platforms that foster a welcomed, comfortable environment in STEM serve a pivotal role in transforming the LGBTQ+/STEM barrier deterring significant scientific advancement.

Summary

The four mainstream objectives to complete LGBTQ+ inclusion in STEM are as follows: (1) cultivating compassion for everyone, (2) separating work from gender, (3) celebrating openness, and (4) employing LGBTQ+ inclusive model policies. Hence, an educational program - even expanding to economics and politics - will be established to foster the inclusion of LGBTQ+ in STEM. Fund acquired from Crimson Youth Fund will mainly be invested for proper compensation of fixed cost, such as the development of policy or educational materials or sourcing of external experts or resources to instigate a program.

Proof of Concept

To suffice Goal 1 (cultivating compassion for everyone), Plan A involves a possible partnership with textbooks or (preferably) journal publishers: a specific section dedicated to scrutinizing commonly confused LGBTQ+ concepts (e.g. gender, sex, pronouns) on a regular basis in accordance with the publication dates. If Plan A incurs possible conflict of interest with the corresponding publishers, projects will be entirely student-guided: Plan B involves team-guided creation of “How To LGBTQ+ in STEM” (see “How To iGEM” as an example), intuitive guide/education material for understanding concepts.

To suffice Goal 2 (separating work from gender), influx and efflux of accountable information must take place. This is done by fostering high school/collegiate research scrutinizing LGBTQ+ in STEM - through a case study, correlation study, controlled experiment, et cetera that can even expand to psychological studies discussing effects of unconscious stimulus (referred to as unconscious bias towards LGBTQ+ community) on decision-making rationale. Encouragement is achieved through the funding of such research or the establishment of a resource hub (e.g. connection to suitable mentors or demographics).

To suffice Goal 3 (celebrating openness), three promotional materials incompletely available commercially will be designed and produced: LGBTQ+-themed stickers, LGBTQ+-themed symbols, and

diction use educational videos. Stickers and symbols will serve to foster a gender-neutral/inclusive workplace (e.g. gender-neutral bathroom, “PRIDE” stickers) and/or learning environments. The educational video will provide concise, engaging tutorials to incorporate appropriate word choices to address certain sexual orientations or gender under a particular circumstance.

To suffice Goal 4 (employing LGBTQ+ inclusive model policies), a hotline network to report gender-based accusation, harassment, or exclusion (either participation or compensation) - noteworthily with ease of access, will be established to develop a constructive workplace where both LGBTQ+ and non-LGBTQ+ identifying STEM personnel can feel protected (of their individual self-concept) and compensated (invariably for the work they have produced). This requires a systematic foundation provided by previously existing “LGBQT+ in STEM” organizations, such as Out To Innovate.

Funding

	Marginal Cost Analysis (USD, cost minimized model)	**Total Cost (USD)**
Inclusion Goal 1	• Plan A section/module design - $0 (intellectual) • Plan A partnership subscription - $100 + @ (month) • Plan B booklet design - $0 (intellectual) • Plan B booklet virtual distribution - $0 • Plan B booklet offline distribution - $50 (printing)	$50 or more
Inclusion Goal 2	• Inclusivity research funding - $50 (research) • Resource hub design - $200 (resource access)	$250 or more
Inclusion Goal 3	• Themed sticker production - $50 (one-time) • Themed sign production - $100 (one-time)	$150 or more
Inclusion Goal 4	• Report hotline launching - $150 (one-time) • Partnership maintenance - $100 + @ (month)	$250 or more

The funding plan organized above adheres to the cost minimization rule of the market. Hence, we request Crimson Youth Fund, after a careful review of our team’s cost allocation and Crimson Youth Fund’s current distributional aptitude, to fund us at a minimum rate of $700, one time: this value accurately reflects the current price index and necessities of this initiative. This funding is expected to occur on a yearly basis, if and only if the terms and conditions below are satisfied. If not, stepwise reduction and/or repeal of the funding plan may be considered by the advisory committee after discussion with the HQ.

The annual funding of $700 is expected to be continued if and only if (1) Inclusion Goal 1 has directly or indirectly affected 50+ people (e.g. dissemination of the booklet to 50+ people), (2) Inclusion Goal 2 has directly or indirectly affected 200+ people (e.g. recipients of the research support fund and visitors of the resource hub), (3) Inclusion Goal 3 has directly or indirectly affected 10+ economic institutions (e.g. videos shown or sticker pasted on non-iGEM business initiatives), and (4) Inclusion Goal 4 has directly affected 50+ people (e.g. visitors of the reporting hotline and actual criminal cases).

Outcomes

To date, Korea_HS's involvement in this initiative, as a part of 2021 International Genetically Engineered Machine (iGEM), is as follows: "LGBTQ+ in STEM" interview (Martina Giselle Ramirez, Ph.D., and John Tilert, M.S.), "LGBTQ+ in STEM" inclusion report and plan (meta-analysis of current inclusion demographics and integrated methods to activism), "LGBTQ+ in STEM"-themed Instagram posting (e.g. featuring of LGBTQ+ STEM practitioners and inclusion demographics), "LGBTQ+ in STEM" webinar, and "LGBTQ+ in STEM"-themed children educational booklet.

Given that the initiatives hitherto established present a key limitation - deprivation of direct engagement to the specific sectors where inclusivity is critical - we propose that through the funding-mediated establishments of the four inclusion goals, effective and efficient methodology to transforming perception directly to the academia is provided. This sets an unprecedented premise to constructing micro/macrosystems that interact to bring gradual change (from a minor change) under a sound foundation to spurting these opportunities for advancement and enlightenment.

Both Team Korea_HS and Crimson Youth Fund willfully agree to the funding initiative - amount, use, and terms - described above. Unless found with fraudulent financial regulations or violations of the terms, the funding shall persist infinitely until modified or restricted under the consent of both entities.

Fund Recipient (Korea_HS):_____

Fund Benefactor (Crimson Youth Fund): _____

Date of Consent (MMDDYY): _____

Recipient Credentials

Team Korea_HS is comprised of 16 enthusiastic high school student-researchers of Synthetic Biology, gathered under a common aspiration to build a better world through original engineering and meaningful collaboration. This year, Team Korea_HS is "Designing a Cancer-Specific Cell-Penetrating Peptide for the Efficient Delivery of siRNA into Cancer Cells." "HS" is an acronym for "High School." Team Korea_HS is comprised of 16+ students with a common ethnic identity but different educational contexts (representing 9+ high schools) bringing fresh, dynamic perspectives from varying backgrounds.

- Team Vitae: Gold Medal (2019 iGEM, 2020 iGEM), iGEMers' Prize (2020 iGEM)
- Team Wiki: https://2021.igem.org/Team:Korea_HS
- Team Email: koreahsigem2021@gmail.com
- Team SNS: @igem2021_koreahs (Instagram)