EPIC
DISCOVERY & INSIGHTS Q1&2 REPORT

Updates and Outlook from the iGEM Startup Ecosystem

FOREWORD

The Q1&2 Insights Report provides the latest updates from iGEM EPIC — the iGEM startup ecosystem.

This year, we present a different approach to the Insights Reports. Apart from the latest updates on the EPIC Founders Database, we give an overview on the numbers and themes of this years VCL, delve into topics shaping our SynBio community in our new section "Comments from the D&Is" and highlight what is happening in the iGEM community on our "Feature Pages", where we team up with other committees from the iGEM universe. In this report we bring to you a brief overview of diversity in EPIC and After iGEM, with a special focus on women in STEAM and the startup ecosystem.

Furthermore, we introduce the new Insights Cycle accompanying the EPIC program, and explain our mission to quantify and improve our entrepreneurial education and mentorship programs for our EPIC teams with the help of data.

Enjoy our Insights Report and feel free to reach out to us!

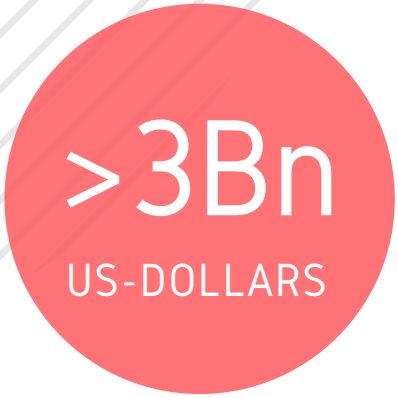
– Marcel from D&I

The iGEM EPIC Q1&2 Report is here!

We present the latest updates from the iGEM startup ecosystem.

CONTENT

FOUNDERS DATABASE **Update**



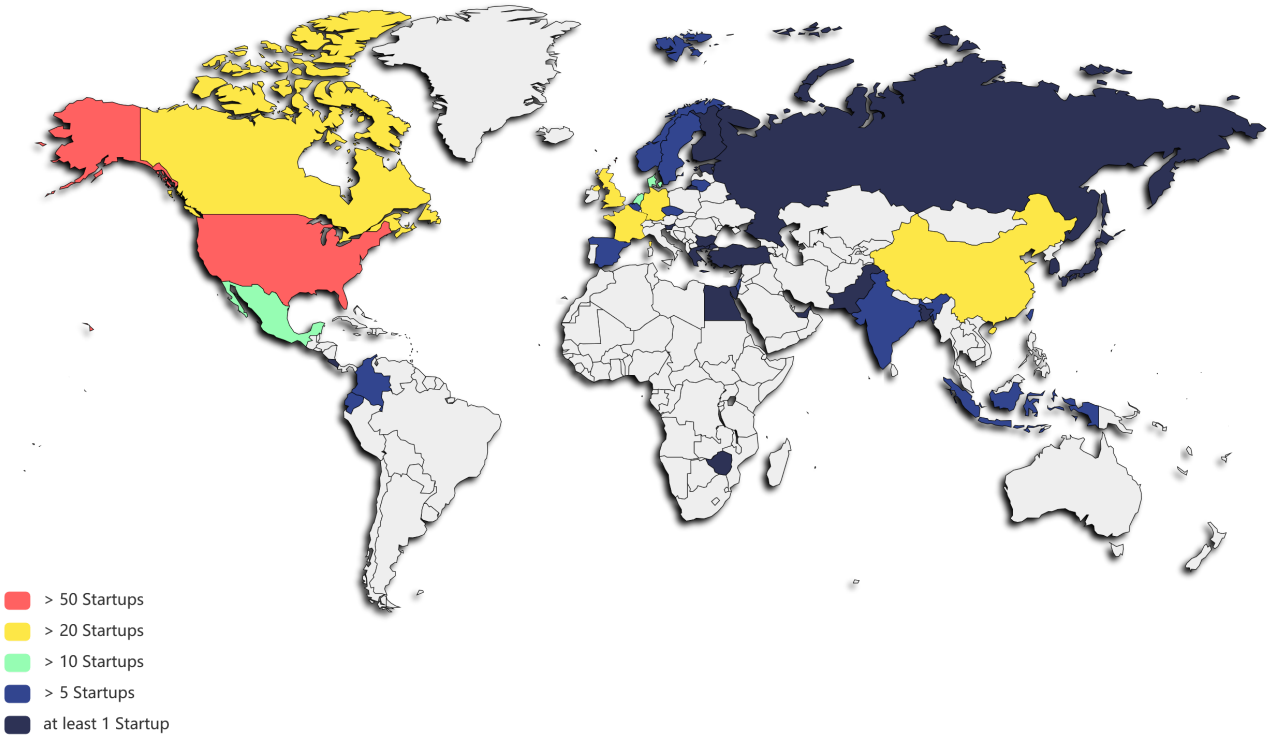
FUNDING RAISED

STARTUPS IN 40+ COUNTRIES

JOBS CREATED

FOUNDERS DATABASE

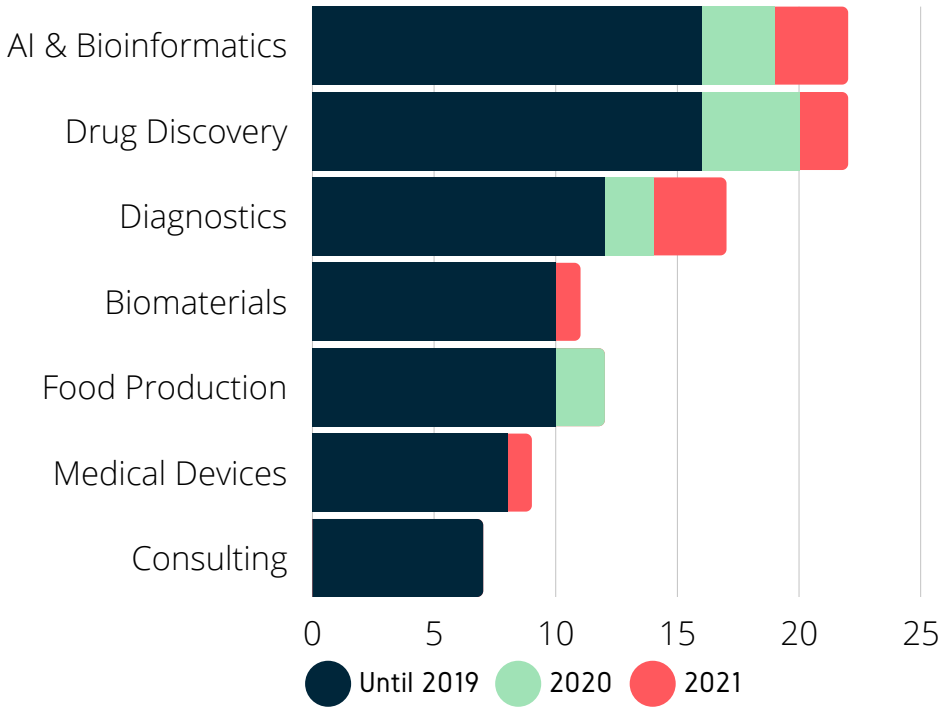
About Areas



Our world is diverse and beautiful. In every country, there are bright minds ready to shape our synbio future. iGEM EPIC aims to increase the regional diversity of the iGEM community. Throughout the years, iGEM teams from all areas have tackled real world problems with the help of synthetic biology. All too often, we realize the existence of problems through the visions and efforts of iGEMers, aiming to contribute to their communities and solving local problems. The goal of EPIC is to enable them to take their projects and ideas to the next level by forming a startup, acquiring funding and providing entrepreneurial education. In the last two years, we were able to bring together enthusiastic bioentrepreneurs from more countries than ever before. But there is still much potential left! The map above shows the number of iGEM startups from each country.

iGEM EPIC has a team for every region of the world. APAC, EMEA and the Americas — our goal is to have 100 iGEM startups each year, from all over the world.

Currently, we are working to increase the number of iGEM associated startups from e.g. South America, Africa and the Asia Pacific region. This year, we were proud that our first two teams from Africa were formed during the EPIC program. Stay tuned for our Q3 report, which will uncover synbio possibilities in EMEA, APAC and the Americas.



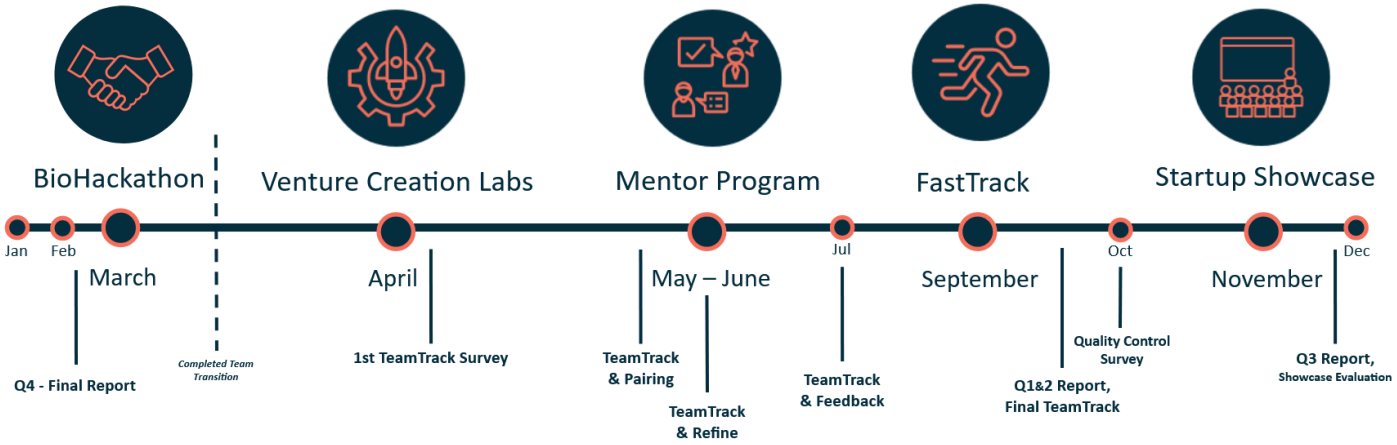
Speaking of areas, let's not forget about areas of expertise! The chart above shows the number of iGEM startups for each of the seven most common fields within our ecosystem. AI and bioinformatics, drug discovery and diagnostics remain as the top three categories. For AI and bioinformatics, this comes as no surprise, considering the current rate of improvement of biological AI methods. Furthermore, the funding barrier for computationally oriented startups is often among the lowest in synbio. Drug discovery and diagnostics are important, broad categories, which have recently experienced an uplift in funding possibilities, not least due to the growing call for innovation following the remarkable demonstration of the potential of synbio-based therapeutics during the SARS-CoV-2 pandemic.

Synbio is inseparably connected to sustainability. The classic feed and food industry is one of the most unsustainable industrial branches to date. Transforming feed and food into a resource-and-animal-friendly bioeconomy is a central and emerging trend of the global synbio market. We have already seen some and expect many more iGEM related startups working in this area in the coming years, bringing this important goal closer to reality. In the iGEM competition, we have observed a remarkable growth of the environmental track. Apart from the inherent resource-friendliness of many industrial synbio ideas, we aim to enable specific environmental projects, such as bioremediation and variants thereof, to become real-world solutions.

iGEM startups stand for innovation in every field of application.

Learn about our most represented sectors and what we expect in the coming years!

THE NEW INSIGHTS CYCLE



This year, Discovery and Insights has restated our mission. At iGEM EPIC, we strive to bring bio-interested people together and allow them to incubate their ideas, ultimately leaving our programm set-up to succeed as a startup in the synbio community. Our job is to quantify the process, to ensure each team receives the best possible input from us, our mentors and our alumni.

The EPIC program kicks off with the BioHackathon, where potential founders get together for the first time to discuss their ideas and find their potential co-founders. In the Venture Creation Labs, the formed teams receive an extensive entrepreneurial education in the form of workshops as well as networking events with alumni, experts and investors. The mentorship program provides more in-depth education and advice for our biofounders — professional, scientific, entrepreneurial as well as personal. Our teams get access to the best seed stage investors and accelerators, to help them found their proof-of-concept studies, in the Fast Track Program. In the Startup Showcase, the best teams attend workshops and pitching competions, while finalizing the developement of their projects and keeping contact with investors and accelerators.

Our teams bring ideas and the Biofounder spirit — It is our job to make them excel.

We at D&I together with the Media and Outreach team release the Insights reports, bringing you the latest updates and interesting developments from the iGEM EPIC community. This year, we have developed TeamTrack, a standardized set of surveys for our teams, allowing us to tailor the best possible experience and impact for each biofounder throughout the EPIC program. With TeamTrack, we follow two simple questions: What do our biofounders need from EPIC? — What can we learn from succesful teams and how can we pass it on to the next generations?

Our goal is to enable as many iGEM alumni as possible to become biofounders and to set them up for success. To achieve this, we track the progression of all our teams and their ideas and obstacles throughout their EPIC journey. This allows us to adapt their coaching and networking experiences and needs more effectively and to distill key insights along their iGEM journey to pass them on — from student, to iGEMer, to expert, to Biofounder.

VCL RECAP

This year's Venture Creation Labs continued to grow in terms of participants and teams, and displayed once again an impressive range of novel and innovative solutions to some of the worlds most pressing problems. The 39 teams that applied to the 2021 VCL consisted of 11 teams from the APAC region, 13 teams from the Americas, 11 teams from Europe, 2 teams from the Middle East as well as for the first time, 2 teams from Africa, with 86 participants in total. The teams addressed many different problems with the help of synthetic biology, ranging from water scarcity and bio-degradable plastics, sustainable sun-screen and hydrogen gas production, to tackling cost-intensive inulin production and the discovery of novel drugs and diagnostics to combat malaria or Covid-19.
Over the course of 4 weeks, the teams received training on the bioentrepreneurial vocabulary, creating a business plan and many other important factors for the creation of a startup. The training was combined with coaching sessions and discussions with expert partners from the synbio and startup worlds, while accompanied by one or two game nights as well.

After the Venture Creation Labs, we survey the teams and participants for feedback on the structure an quality of the program. Almost all of the participating teams felt that the overall structure of the program was well fitted to their needs, and that all lessons and coaching sessions were helpful, concise and easy to follow.

Venture Creation Labs 2021 — 86 Participants, 39 Teams with unique Ideas

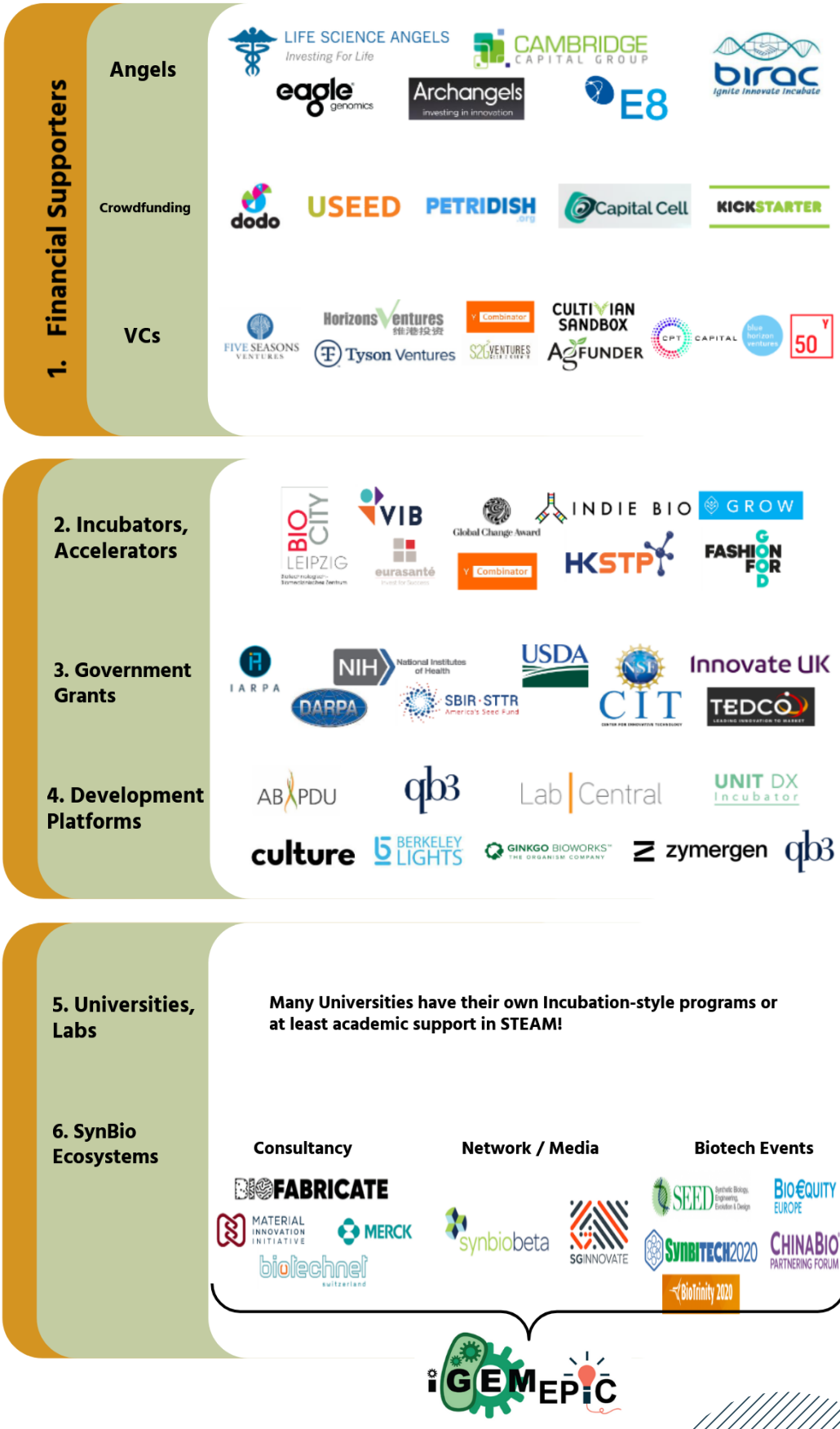
Furthermore, we received positive feedback on the guided problem analysis and assessment of relevance of the ideas and solutions the teams designed. Almost all teams thought that the skills and areas of expertise of the members and the team as a whole were well defined after the program, and the teams were generally satisfied with the construction of their respective road-to-market strategies as well as the identification of potential risks. Last but not least, most teams felt confident with the feedback and training they received regarding discussions with potential investors and customers.

Some teams noted that more coaching on the identification of future competitors and detailed analysis of their unique market position compared to possible competitors would have been helpful, which we will build upon in the next iteration of the VCL.

We want to thank all teams for their transparent feedback. We will continue to improve our program with a special focus on your valuable insights.

During the VCL, the teams from all regions receive a lot of input, from creating optimal business-plans to selling their ideas and proof-of-concept. One of the most important questions for upcoming startups is how and where to acquire seed-stage funding, expertise from mentors and access to laboratory space or technology platforms, if necessary. However, when starting to enter into world of entrepreneurship, the vocabulary and enormous amount of different companies and types of available support can be quite confusing.

This is why we at iGEM EPIC have placed significant effort in building a large network of partners, and for the VCL, we prepared a comprehensive overview of some well known financial supporters, accelerators, government grants, development platforms and synbio ecosystems. The iGEM EPIC ecosystem combines expertise from entrepreneurship, marketing and consultancy and the hosting of networking and synbio events.



COMMENTS FROM THE D&Is

On growing everything... Gingko Bioworks — an iGEM story

iGEM started out as an MIT course in 2004, with the goal to encourage students to think independently and come up with solutions to problems using synthetic biology. What better way to motivate students to put in the work than a little bit of healthy competition? Little did we know that this small competition and community will soon grow to new orders of magnitude with 350+ teams from 45+ countries today!

The iGEM spirit has stayed the same ever since, favouring creativity over narrow thinking, exploration over repetition and exchange over seclusion.

It takes a certain type of personality to commit to an iGEM team and project. From an outside view, something seems inherently off about the combination of the sometimes quirky ideas of iGEMers and the sterile expectations forming in our imagination when envisioning 'actual scientists' doing 'actual science'. Something feels incongruous about the explorative approach iGEM teams take towards a project plan, often without any experience, when comparing it to the meticulous proposals, statements of intent or business plans of 'real research groups'. One of these quirky ideas from 2006 was to program E. coli to produce olfactory compounds and make a perfume out of them, "Eau d'e coli". The same inexperienced students soon became 'actual scientists' and co-founded Gingko Bioworks in 2009. Today, twelve years later, their company entered the public market, valued at over 15 Bn USD. The organism company, as Gingko describes itself, characterizes the slogan "grow everything". The idea of iGEM to program biological matter is rooted undeniably deep in the company's philosophy, although likely not much of the methodology of their original iGEM project has aged equally well. What is it then, that stuck?

The reflection on the shared theme of iGEM journeys calls for a corny yet reminiscent comparison to the attitude of children, but there is more to it. Many iGEMers are children, teenagers, students when first having these experiences. Aside from the assignment of such presumed inherent qualities, a more satisfying answer can be distilled here. We often think about how we get people to get into STEAM, or how to get them excited for mathematics or politics. How do people really get into anything? They grow into it by working on it in a simulated environment. The graduation from some trial and error process, inexperienced and yet fueled by a cause is arguably one of the most rewarding experiences attainable, and at the core of curiosity, which, combined with the expectance of tolerance for risks and failures, is what makes us excel at being a scientist, an entrepreneur or at any other task. Growing everything is an amazing objective for a platform company and probably also a very marketable one. Now we know, conceptually, where this inspiration came from. The iGEM experience has exposed us to this fascinating process and has grown all of us in doing so.

On spreading everywhere... How the pandemic shaped the synbio landscape

The last two years have taken a toll on everyone. This is not what we want to elaborate on in this brief comment. Instead, we want to focus on an aspect related to our synbio community, that could perhaps - and we thought about this carefully - be described as a silver lining. Most attentive readers have already begun to think of home office days and subsequently of 8 AM meetings in sweat pants below the sacred line, splitting off the illusion of order, created by the lower border of the webcam FOV and the table. Good guess, but not the comfortable relic of the pandemic in question.

The sole reason, and this is no secret although some may think so, our society managed to steer through this crisis as it did, are the years of research on coronaviruses, which allowed for an extremely quick development of potential vaccines.

This however, is only a quarter of the story. If you will, it is the necessary condition to this success. The next quarter are the years of research on mRNA-vaccines. A technology which has been well described scientifically, but was nowhere near this amount of public perception, even though the first clinical trials with mRNA-based vaccines against rabies were already started in 2013.

The last two quarters are what we want to emphasize here. Both have to do with the perception of synbio and genetic engineering methods by society, one of legislative nature and one completely personal. The exceptions and changes in regulations almost all countries and institutions involved have made to speed up the development of vaccines by tenfold is remarkable, especially when considering the relative novelty of mRNA-vaccines. The trickle-down effects of these decisions can already be seen in elections, campaigns and party platforms around the world. Throughout Europe for example, parties previously sceptical or conservative towards genetic engineering in medicine and agriculture have reexamined their opinions.

Last but certainly not least, the perception of the public towards the vague scientific mystery of genetic engineering has changed. 'Vague mystery' is a somewhat correct description for many people outside of our synbio community, which is, by all means, on us. The perceived climate of the discussion about synbio and genetic engineering in the broad public has changed from disinterest to a common starting point for the conversation. Science is complicated and often, scientists like science to be complicated. We have to use this opportunity to create a productive type of public science communication - by simply starting to communicate in our immediate social surroundings. We make the following suggestion: Pick one person a week, 10 to 15 minutes of conversation about synbio, starting on the common ground - the vaccines. Let us know about your conversations! Have fun!

CHAMPIONING DIVERSITY IN EPIC

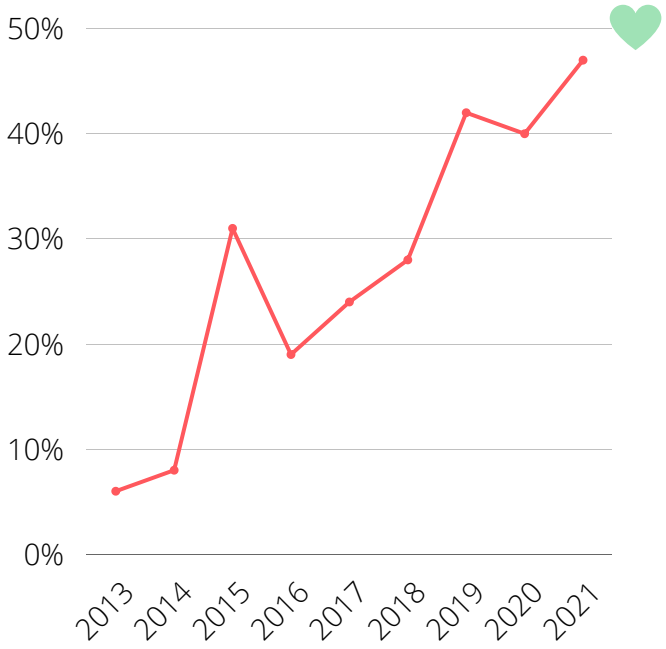
The iGEM community is proud of their diversity, and so is iGEM EPIC. For this feature page, we have teamed up with After iGEM to take a look at what is happening in our comittees in terms of diversity. For iGEM EPIC, we have already talked about our efforts to increase the regional diversity within our startup ecosystem. While we must expect to need more than one round of the EPIC program to reach our vision for global diversity, we are happy to report that we are much closer to reaching our diversity goals.

At iGEM EPIC, each year we bring together many biofounders from different backgrounds and countries. To the right we have graphed the percentage of female biofounders associated with EPIC since 2013. In 2021, 47% of our biofounders are female.

At EPIC, we are proud to have coined the term "biofounder" and we hope to announce to you next year, that we have reached "biofoundress equilibrium".

After iGEM launched their project WiSTEM (Women in STEM) in 2020, raising awereness for underrepresented females in STEM and synbio. This September, they started a series of panel discussions about inspiring women to get into STEM subjects as well as motherhood in our community. On top of that, After iGEM has organised multiple regional gatherings of iGEM teams and alumni through their ambassador program, such as the LATAM Fest and the CSH Asia meet-up, while we at EPIC have been part of a special meet-up in Navarra. Stay tuned for our Q3 report, where we provide more insights into our combined efforts to streghten the synbio community in every region of the world!

iGEM stands for diversity — EPIC is on board ... and on track!



THIS IS US!

MARCEL WITTMUND
EMEA

Hello there! My name is Marcel. I'm in the first year of my master program in molecular and applied biotechnology in Aachen, Germany. My iGEM journey started in 2020 as the team leader of iGEM Aachen. As for many fellow iGEMers, my iGEM experience has had a profound impact on me... and that's how I ended up at EPIC!

I mainly work in bioinformatics and posses very little wet lab skills.

I enjoy maths, music and going out with our dog Mandu.

TONY YEOH CHUIN SHUNG
APAC

Hi everyone. My name is Tony. I'm in my final year of my undergraduate program, mastering in biotechnology in Taiwan. This is my second year as Discovery & Insight lead for EPIC APAC, and the experience was well worth it. I currently rotate in a lab focusing on cancer research. I do enjoy reading while I am in my down time.

CONCLUDING REMARKS

Feel free to write us comments, feedback or suggestions for comments or feature pages in our upcoming reports!

The Q3 Insights Report will release at the end of November. In it, we will have a closer look at the EMEA, APAC and Americas regions and disucss their synbio landscapes, opportunities and what iGEM and especially EPIC do to expand the community into more countries.

The Q4 Insights Report will release in February 2022 and will be the last for this year's team. In the final report, we hope to give you a first look at the results of our TeamTrack mission, highlighting the typical progression as well as some stories of iGEMers becoming Biofounders!

Now that you are updated with our latest data, thoughts and news, do not delete your .pdf just yet...

... something about the final page of this report seems odd, you might need it in the near future. 😊

Stay tuned!

Thank you for checking out our Insights Report!

Follow iGEM EPIC to stay updated in the future ❤

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