The Synthetic Biology Community in Pakistan

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Pakistan

• Population: 212 million
• Largely an Agriculture Economy
  – 21% of GDP
  – 45% of labour workforce
  – 29.4 million tonnes of milk produced
Our work so far
SynBio in Pakistan

• Grassroots story sparked mainly by IGEM, the International Genetically Engineered Machines competition
• Ripples already created by IGEM Alumni
  – Community Labs
  – Startups
  – Open Agriculture
  – Open Hardware
  – BioArt
  – ELSI
SynBio in Pakistan

• ‘Multiple nuclei’ of communities
  – BioE
  – IGEM
  – Startup Weekend
  – The ‘Undivided’: bioart community
  – Precision Medicine Lab
  – Outreach activities
  – Seminar series
  – Training series
Peshawar’s Bio Ecosystem

- IGEM16: 12
- IGEM17: 13
- BioE: 170+
- BYLC: 210+
- PI s/APs: 60+
- BioArt: 20+
- LabSkills: 73
- Startup Weekend SynBio: 95+
- biotech grads in KP: 4000+

3 large private hospitals
1 large public hospital + others
60+ smaller clinics
30+ pharma units
10,000 OPDs+
SynBio in Pakistan

• Strong student outreach
  – 18000+ public/private, rural/urban, boys and girls,
  – All four provinces
  – 200+ events
  – 60+ schools
  – 10+ science fairs
  – National STEM School
  – All print, media and social media outlets
SynBio in Pakistan

• A rejuvenated National Institute of Health in Pakistan
  – A very active Pakistan Biological Safety Association with international partnerships in place, especially the US NIH’s Fogarty Centre.
SynBio in Pakistan

• Inter-disciplinarity is inevitable, but culturally very difficult.
  – Barriers in curriculum and pedagogy at universities
  – Barriers in research collaborations
  – Barriers in research funding
Challenges and Opportunities

Implications of Carlson curves
  Increase in performance
  = Drop in costs
  = Democratization (Biology’s PC moment)
  = More innovation
  = More regulation? Different across regions?
  = Access and Benefit Sharing?
Challenges and Opportunities

• Discourse on Responsible Research
  – Not their in the curriculum
  – Can PBSA be leveraged?
  – Can the national Higher Education Commission (HEC) be supported to support this and also ELSI research?
Challenges and Opportunities

• Capacity in the Public Sector
  – The S&T infrastructure within the government needs a lot more specialists.
  – Currently, in the current economic climate, not a priority area for the government.
Challenges and Opportunities

• 64% of the country falls in the youth, 70%+ in KP.
  – Can we engage the youth upfront and help with exciting research directions?
  – Can we invest in young researchers, through formal channels: startups, graduate scholarships, etc?
Challenges and Opportunities

• Leveraging non-curricular science
  – Can Outreach be used as a vehicle to promote RR?
  – Can IGEM be used as a vehicle to promote RR?