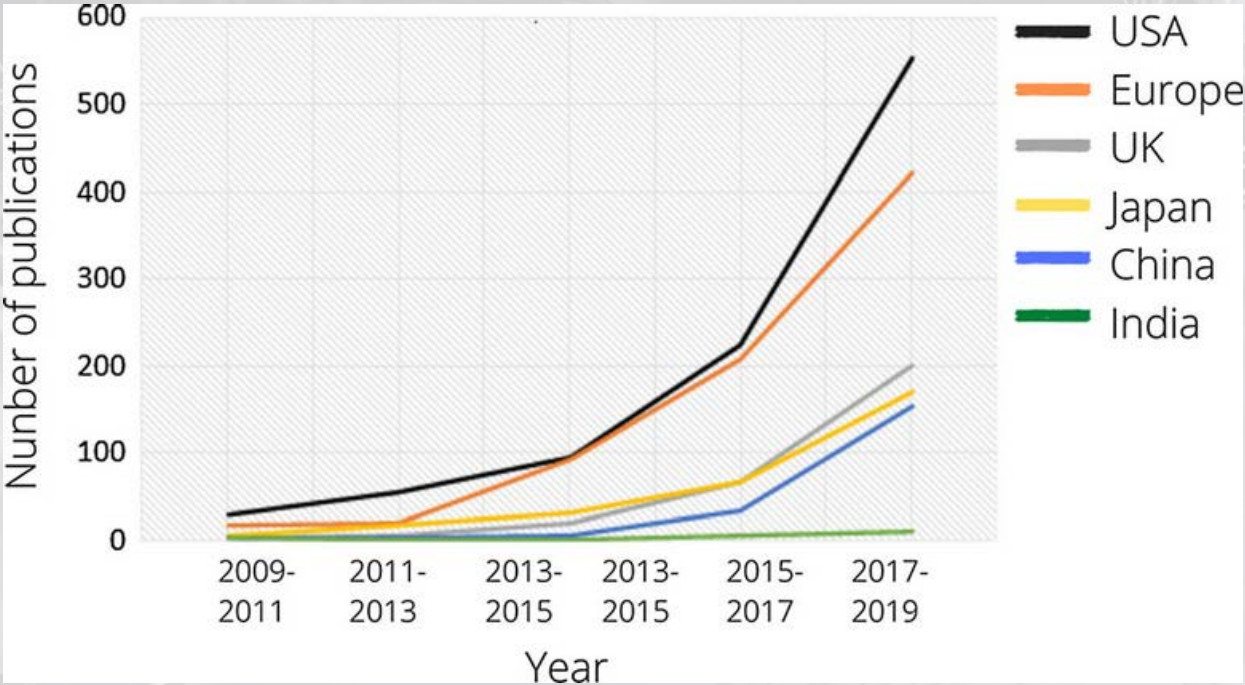


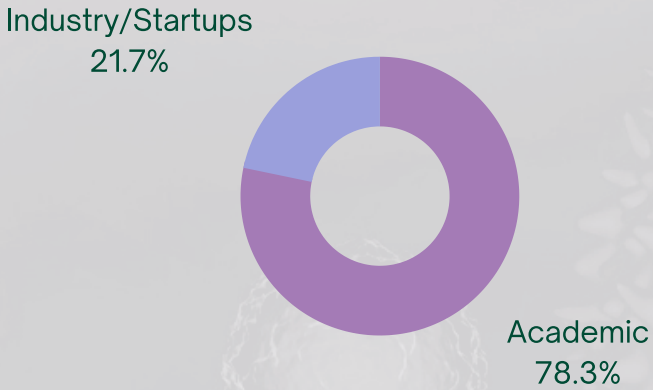
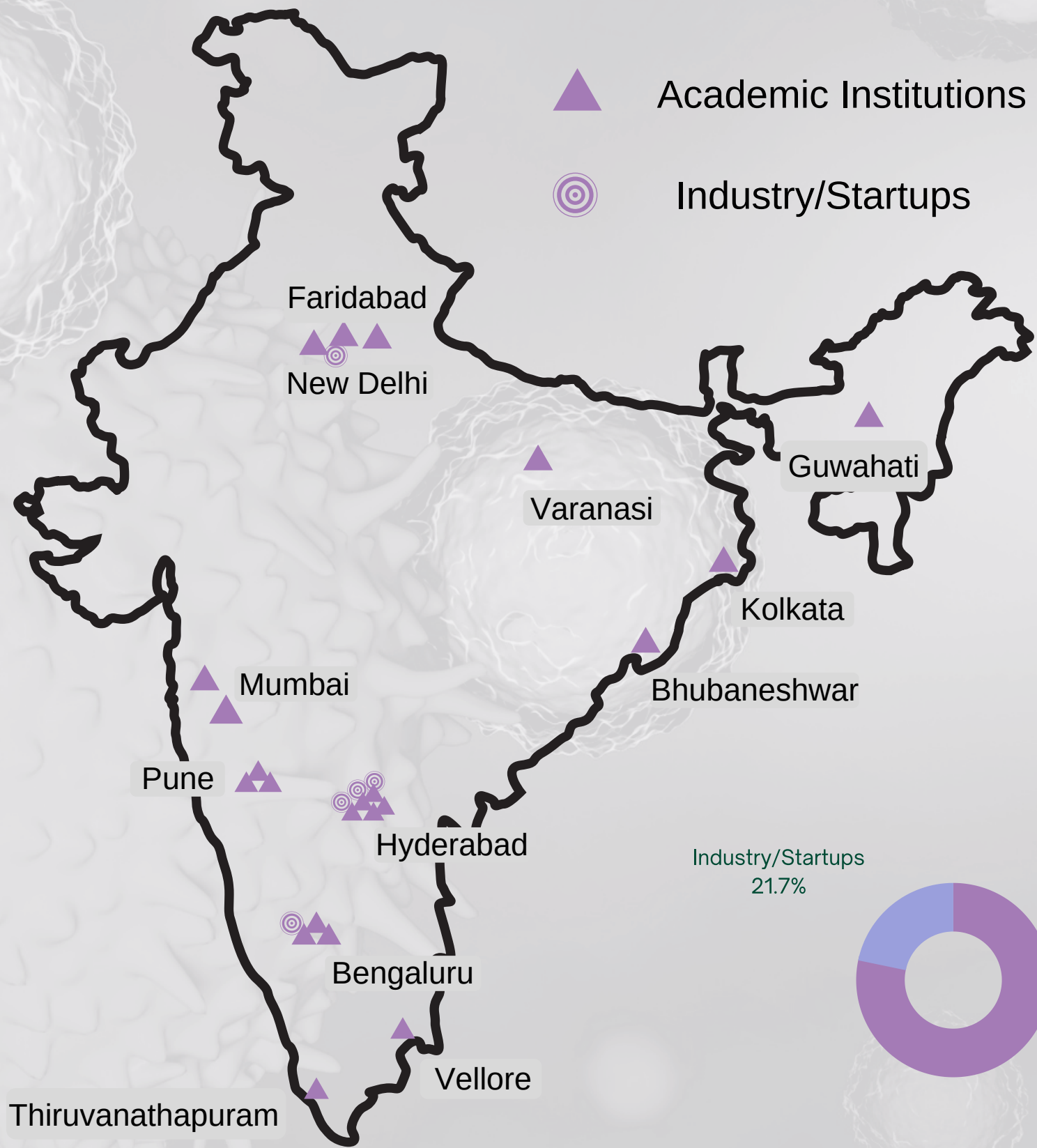
Centre for Predictive Human Model Systems
Atal Incubation Centre-Centre for Cellular and
Molecular Biology



ACADEMIC LABS/COMPANIES WORKING ON MPS MODELS IN INDIA



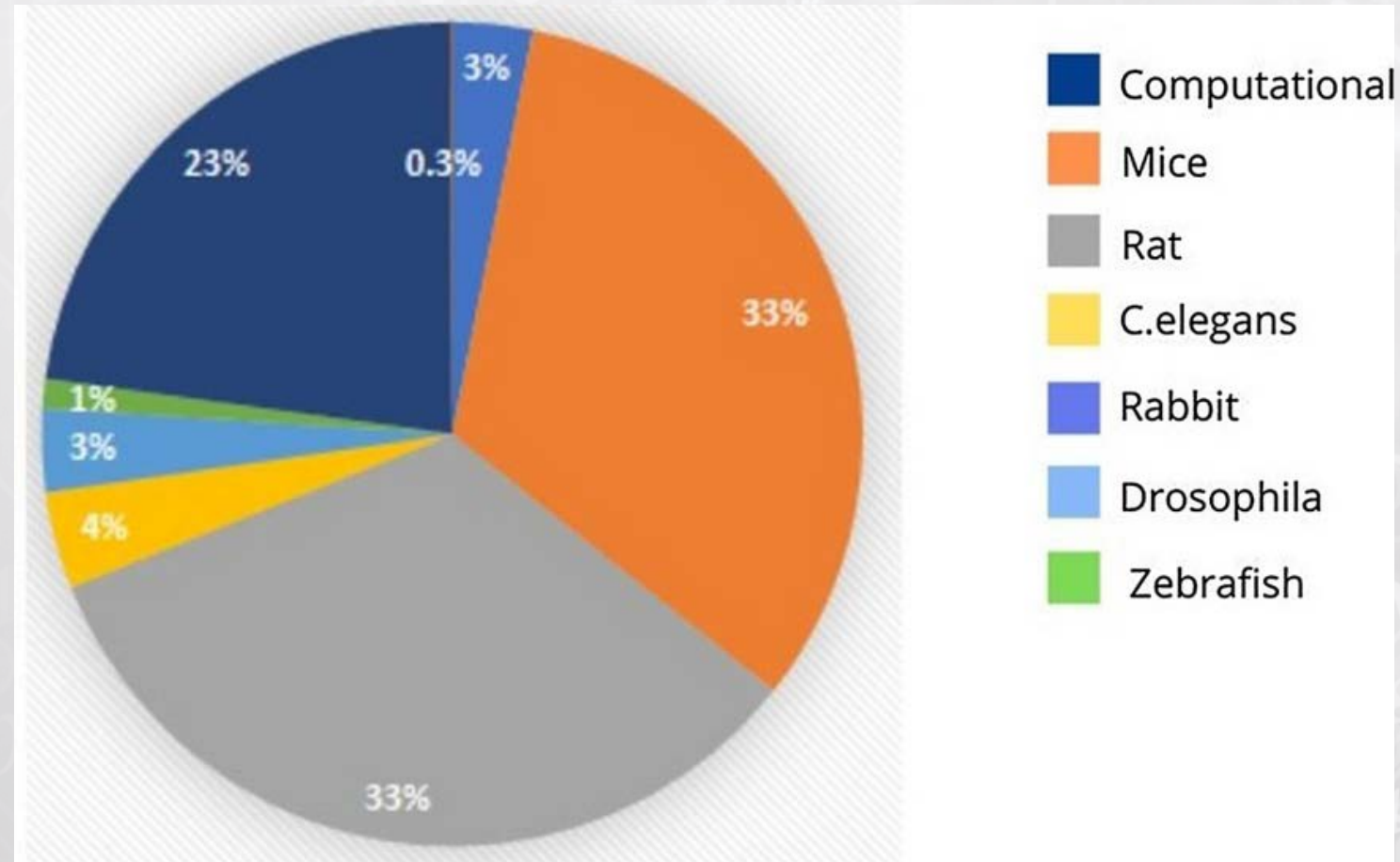
Number of papers published globally in the field of organoids.



**This image is based on analysis performed in 2019*

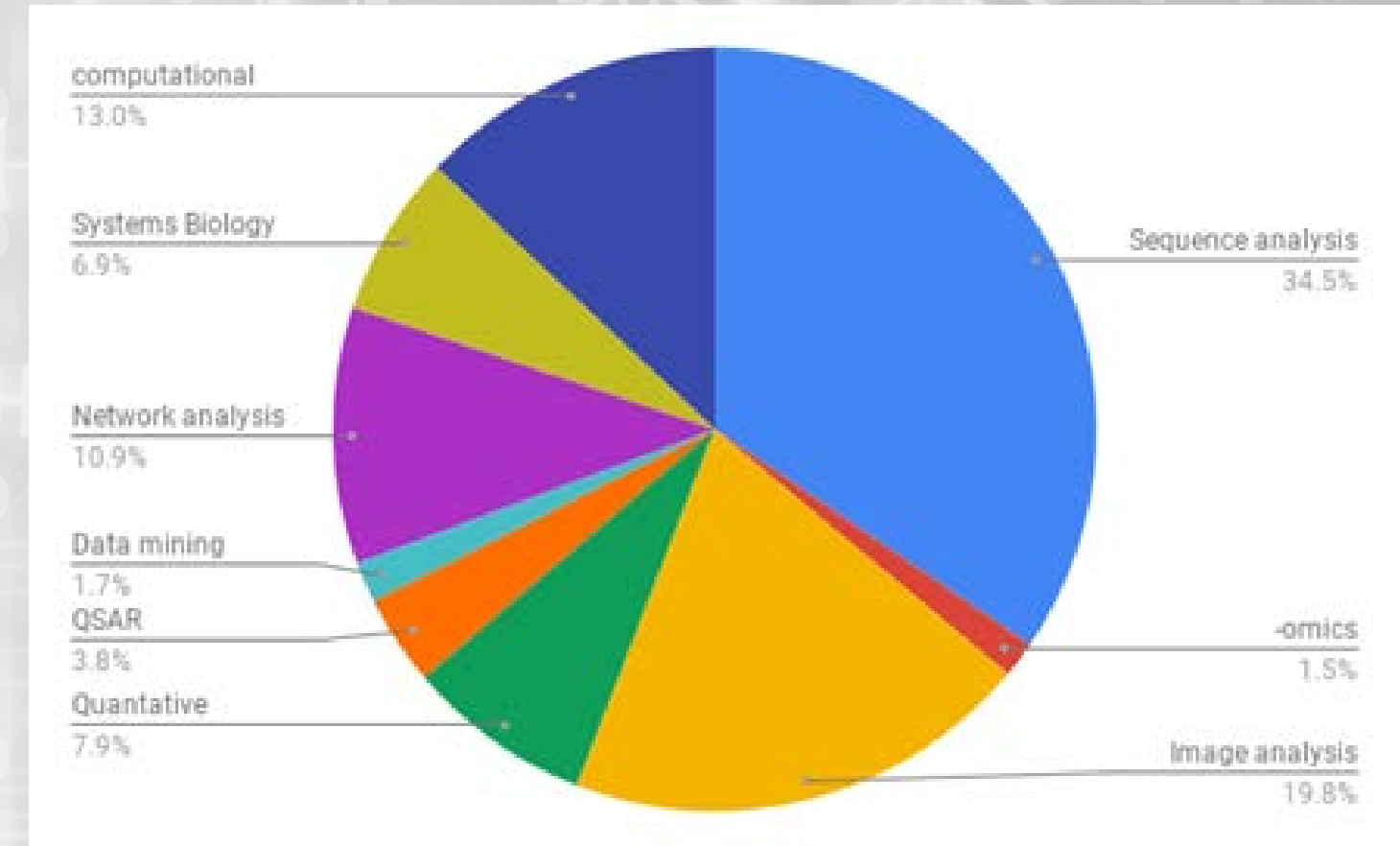
IN SILICO MODELS: A WIDELY USED TOOL IN INDIA

Papers published in India using various model systems in the past decade.



(Parvatam et al. 2020)

Mapping of sub-areas of computational biology research performed in India



REGULATORY INITIATIVES TOWARDS USE OF NON-ANIMAL ALTERNATIVES IN INDIA

Prevention of Cruelty to Animals Act **1960**

Indian National Science Academy (INSA) releases 'Guidelines for care and use of Animals in scientific research' **1992**

Indian Council for Medical Research (ICMR) releases 'Guidelines for use of lab animals in medical colleges' **2001**

Ministry of Health and Family Welfare (MoHFW) bans the use of animals in educational institutions
University Grants Commission (UGC) releases 'Guidelines for discontinuation of dissection and animal experiments in lifesciences in a phased manner' **2012**

India becomes first South Asian country to ban the import animal tested
MoHFW bans the use of animals for cosmetic testing **2014**

Ministry of Agriculture revises its pesticide testing regulations to recognise modern, human cell based alternatives **2017**

Breeding of and Experiments in Animal Rules, 1998.
Amended in 1998, 2001 and 2006 **1964**

Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA) **1998**

Medical Council of India (MCI) amendment - Recommends to use alternatives to replace animal testing **2009**

Bureau of Indian Standards bans the use of animals in cosmetic testing **2013**

MoHFW bans the use of 'Draize irritation test' using rabbits
MoHFW passes an amendment sparring repeat animal testing for new drugs in cases where previous data exists
Amendment to the Drugs and Cosmetics Rules, 1945 accepted NAM for dermal and ocular toxicity tests **2016**

Indian Pharmacopoeia Commission dropped pyrogen testing on rabbits and the abnormal toxicity test on guinea pigs **2018**

FUNDING STATUS FOR NON-ANIMAL METHODS IN INDIA

Funding by Department of Biotechnology (DBT) towards stem cell biology & organoids/organ-on-chip

Sl. No	Year	Total Funding (INR Crores)	Stem cell biology (INR Crores)	Organoids / organ - on chip / 3D (INR Crores)
1	2013 - 2014	732.74	120.54	13.49
2	2014 - 2015	816.5	216.31	1.94
3	2015 - 2016	613.48	144.21	141.36
4	2016 - 2017	753.62	16.32	2.01
5	2017 - 2018	1239.95	52.15	3.49
6	2018 - 2019	1747.44	14.8	5.77
7	2019 - 2020 (Upto Jan 14, 2020)	527.09	13.34	0.42
8	Total funding 2013 - 2020 (INR)	6430.82	577.67	168.48

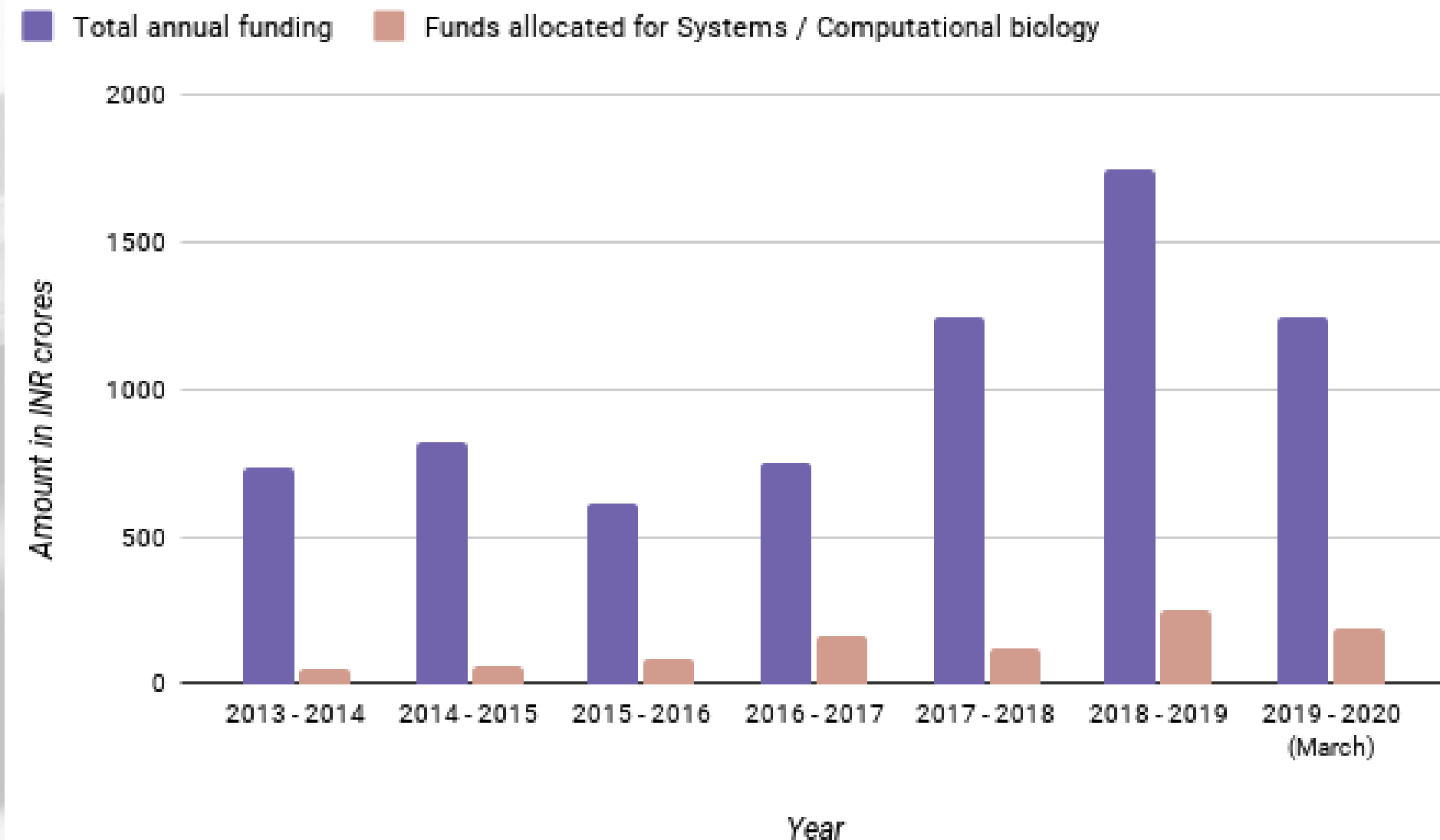
Number of projects funded by Department of Biotechnology (DBT) towards stem cell biology, organoids, organ-on-chip projects

Sl. No	Year	No of projects	Stem cell biology projects	Organoid/organ-on-chip/3D projects
1	2013 - 2014	650	15	3
2	2014 - 2015	621	25	3
3	2015 - 2016	392	5	1
4	2016 - 2017	517	15	3
5	2017 - 2018	746	24	6
6	2018 - 2019	724	14	4
7	2019 - 2020 (Upto Jan 14, 2020)	510	7	1
8	2013 - 2020	4160	105	21

FUNDING STATUS FOR IN SILICO METHODS IN INDIA

Funding granted by
Department of Biotechnology,
Ministry of Science and
Technology towards systems
and computational biology
(2013-2020)

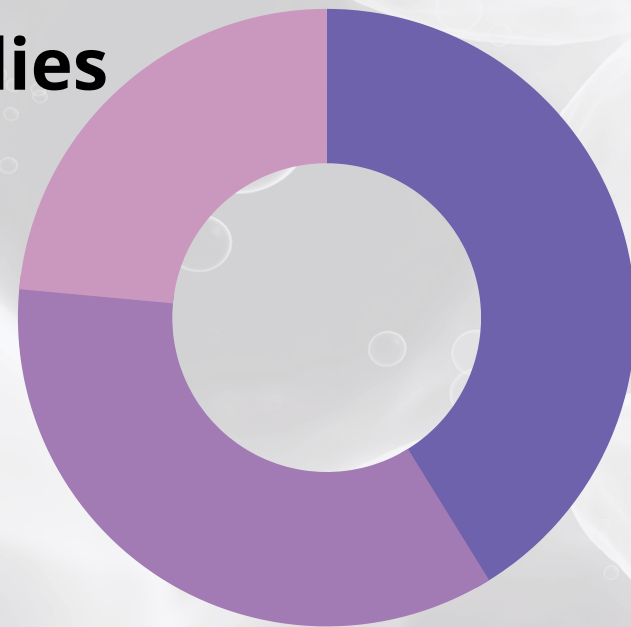
DBT Funding from 2013 - 2020



While there has been a huge spurt in the research and industry groups in human-relevant research, there has to be parallel movement in funding and regulation

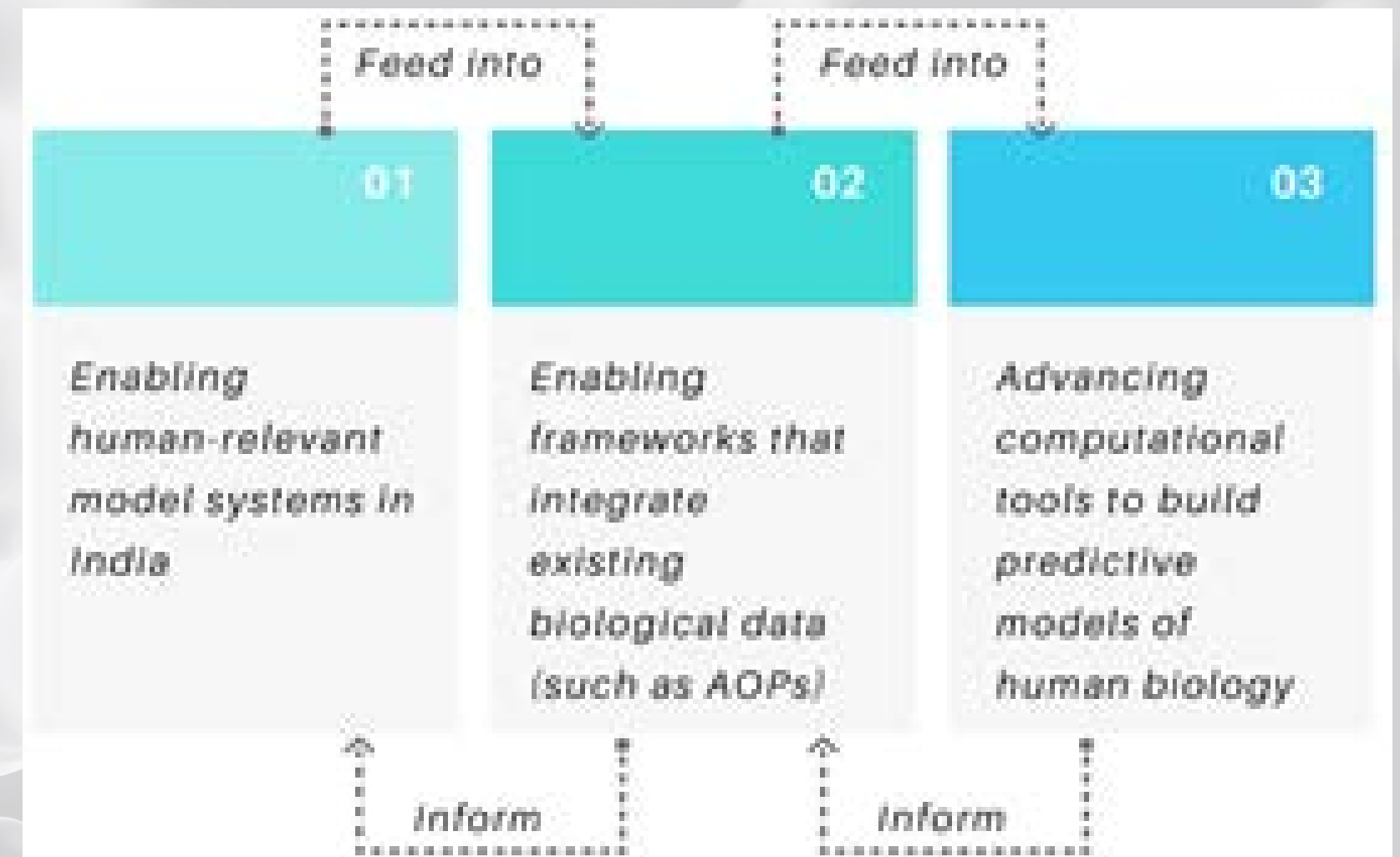
ROUNDTABLE ON 'ENABLING A SHIFT TOWARDS HUMAN-RELEVANT PARADIGM IN BIOMEDICAL RESEARCH AND DRUG DISCOVERY IN INDIA'

**Private
funding bodies
(4)**



**Industry
(6)**

**Academia
(7)**



RECOMMENDATIONS FROM THE ROUNDTABLE

Improve the supply chain for molecular grade reagents – a huge market opportunity for India

Create Regional and National Centre's of Excellence for developing “proof-of-concept” and validation

Setting core facilities for raw materials, such as primary cell lines

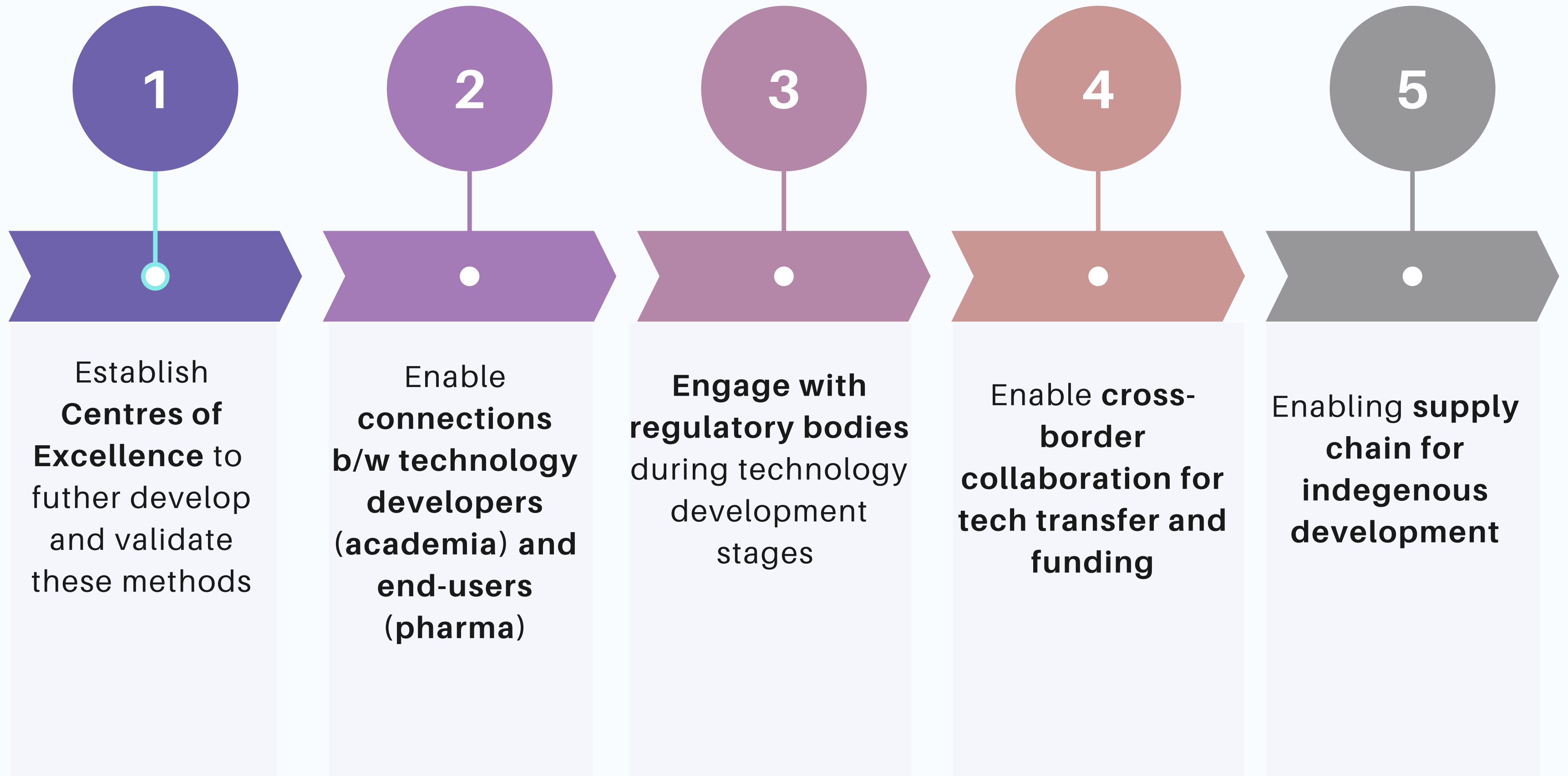
Support webinars/courses/workshops to increase awareness

Develop co-funding models involving joint investments by government, pharma companies, philanthropic bodies, and venture funds

Develop “exit strategy” in collaboration with industry to understand how these technologies can be adopted by industry and translational programs

Encourage cross-border collaboration to bring in both global expertise and international funding

ROADMAP TO ENABLE HUMAN-RELEVANT RESEARCH IN INDIA





Thank you

*To know more about CPHMS and
our different initiatives, please go to*

<http://aic.ccmb.res.in/cphms.html>

