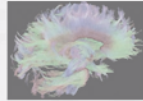


Of the Public, for the Public	Innovation Made Fundamental
No barriers	Foundational research
Expertise brought to bear	New learning
Working for democracy	Translation
	Adapting to workforce/students
Preeminence	
Economic powerhouse for state	
Graduates prepared for the new economy	
Global mindset	
Address big societal questions	

Strategic Framework

- Building painkillers that lack addictive qualities (Bryan Roth)
- Turning on genes to cure autism spectrum disorders (Ben Philpot & Mark Zylka)
- Innovating non-invasive treatments for brain disorders (Flavio Frolich)
- Developing novel strategies to treat Alzheimer's disease
- Discovering new ways to treat overeating and obesity



Basic	Translational	Clinical	Population-based
<ul style="list-style-type: none"> • Cariology and periodontology • Craniofacial biology and development • Materials and cell guided bone and muscle regeneration • Molecular and genetic basis of acquired and congenital craniofacial dysmorphologies • Molecular & genetic basis for chronic pain 	<ul style="list-style-type: none"> • Fluoride metabolism and pharmacogenomics • HIV/AIDS associated oral diseases • Kaposi's sarcoma-associated herpesvirus (KSHV) and immunity • Fluorescence-aided caries excavation (FACE) • Large Animal Models 	<ul style="list-style-type: none"> • Dental materials • Cleft Lip/Palate outcomes, quality of life, orthopedics • Oral and cranio-facial 3D imaging • Orthognathic surgery outcomes • Oral Cancer • Chronic Pain • Caries • Nano-Crystalline Ceramic Coating to 	<ul style="list-style-type: none"> • Early childhood caries pediatric and health services interventions • Social determinants of health / disparities • Oral health literacy • Oral health and aging • Education-based research

Cosmology – Gravity

- What is the ultimate theory of gravity?
- What is dark matter?
- Origin of original conditions?
- What is dark energy?
- Cosmological limits on neutrino mass

Astronomy-Astrophysics

- First structure?
- Origin of the elements (BBN & stars)?
- Mass inventory (DM, gas, DE)?
- Dark energy?
- Exoplanets & life?

Nuclear

- Origin of heavy elements?
- Why more matter than antimatter?
(EDM for a fundamental particle?)
- Neutrino mass/properties/interactions
- Why is strong C/P so small?
(Is there an axion?)
- Properties of quark-gluon plasmas
- Spin and mass of nucleon

Particle

- Source of the matter/antimatter asymmetry?
- What is the nature of dark matter?
- What is the mass and nature of neutrinos
- What will be the new standard model (BSM)?

What is Research at Carolina?

Bi-weekly meetings with research Deans and Pan-Campus Center directors have informed:

- Key research strengths/priorities
- Common thematic areas for inter-disciplinary collaboration

- Public Health
and Social
Medicine

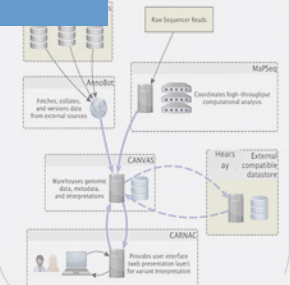
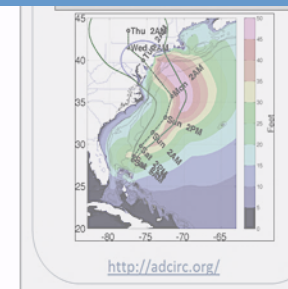
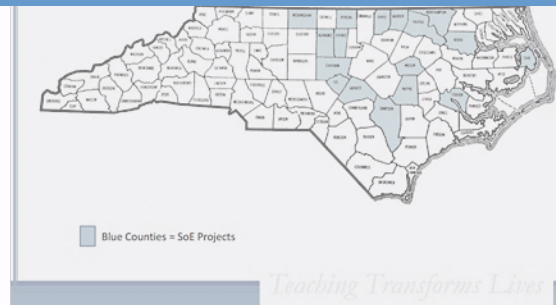
UNC Centers

- Gfeller TBI Center
- Carolina Center for Health Informatics
- Thurston Arthritis Research Center
- North Carolina Institute for Public Health

UNC Schools Departments

- ork
y
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ication

Impacting Infr



Six Strategic Research Priorities



BRAIN



CANCER



DATA SCIENCE



ENVIRONMENT



**OPPORTUNITY, WELL-BEING
and CULTURE**



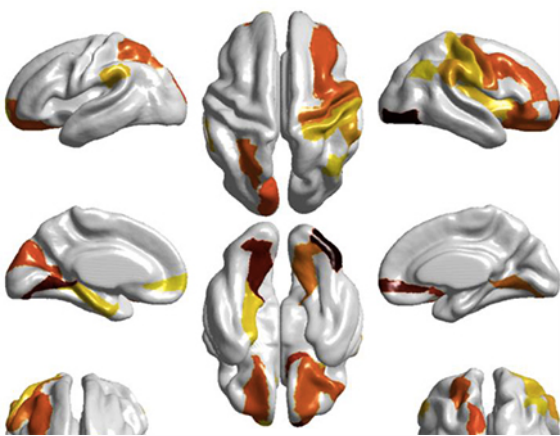
**PRECISION HEALTH
and SOCIETY**



BRAIN

*Structure, behavior,
development, disease*

- Circuits, neuronal cell types, neuroscience and neural activity



- Child development
- Nutrition and social/environmental effects
- Mental health and addiction
- Effects of medication on cognition
- Trauma and Concussion
- Strong leadership in Autism research
- Educational intervention





CANCER

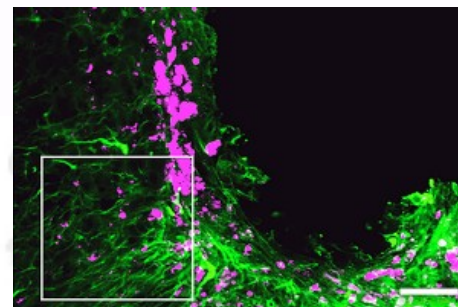
*Comprehensive program
in research, health care,
public health practice*

- New technologies for diagnosis and delivery of therapies
- Social determinants
- New treatments
- Environmental and behavioral effects
- Bioethics and social science in medical research



Collaboration with IBM Watson to utilize artificial intelligence to improve patient treatment

Flipping Cancer:
Performance
installation in visuals
and dance/movement



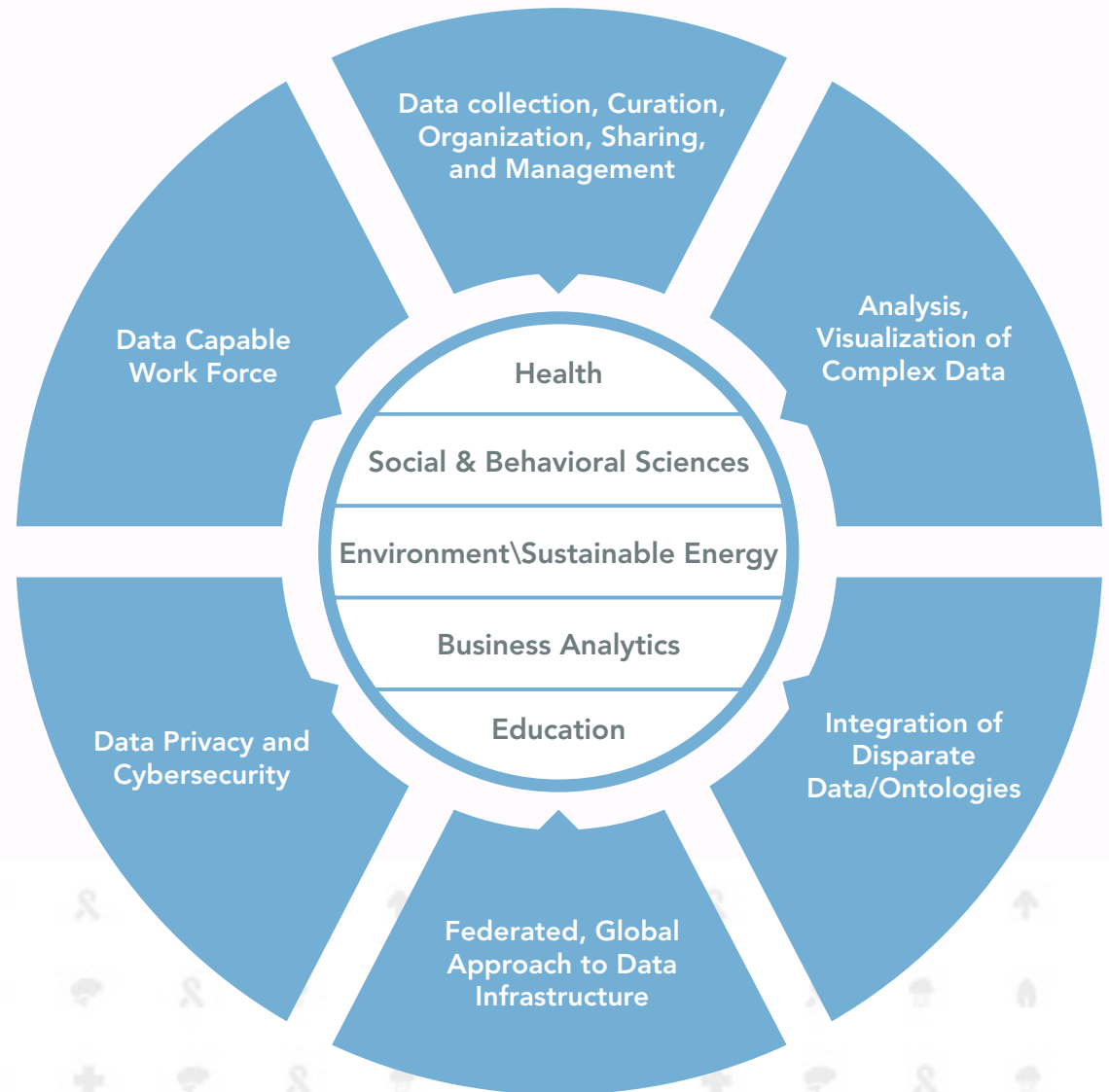
Falcon Therapeutics:
Treat brain cancer with
neural stem cells
(green) that seek out
and destroy cancer
cells (pink)



DATA SCIENCE

Research Frontier of the Future

- Integration and application of data science tools and methods to solve complex problems





ENVIRONMENT

Many strengths spanning different areas of environmental research and cross cutting tools

7 schools | **14** departments | **17** centers and institutes





OPPORTUNITY, WELL-BEING and CULTURE

Evaluate access to opportunities and elucidate their relationships to outcomes

- Investments in early childhood education, schooling and health
- Migration, Work Family, and Wealth
- Humanities for the Public Good
- Psychosocial Health



Photo by Cory Doctorow,
titled "Poesy learns to climb the stairs"



Photo supplied by World Bank Photo Collection. Students raise their hands to answer a class questions at the St. Louis Primary School in Kinshasa



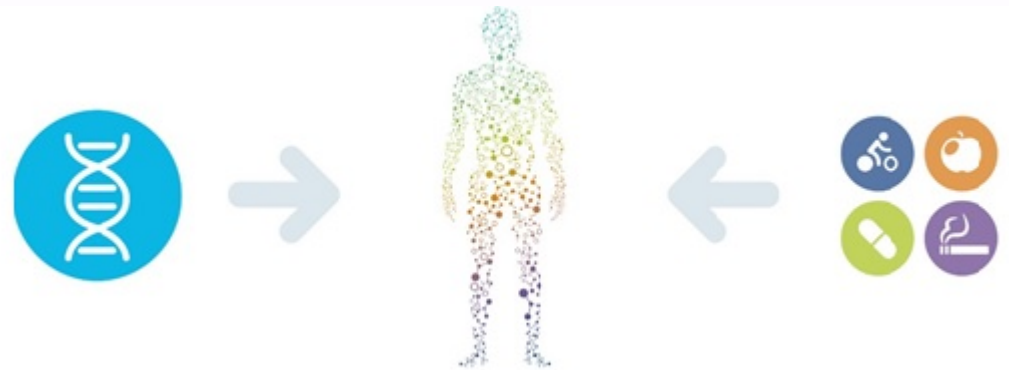
Colossal archaeology. Excavation of the head of a 5m tall statue of Hadrian. Sagalassos, Turkey, 2007 by @KU_Leuven



PRECISION HEALTH and SOCIETY

*Tailoring development of
new therapies, &
individualized delivery
of healthcare*

- Individual gene variability
- Environment
- Lifestyle
- Social structure
- Geographic location
- Behavior



Source: Metabolon



Six Strategic Research Priorities



BRAIN



CANCER



DATA SCIENCE



ENVIRONMENT



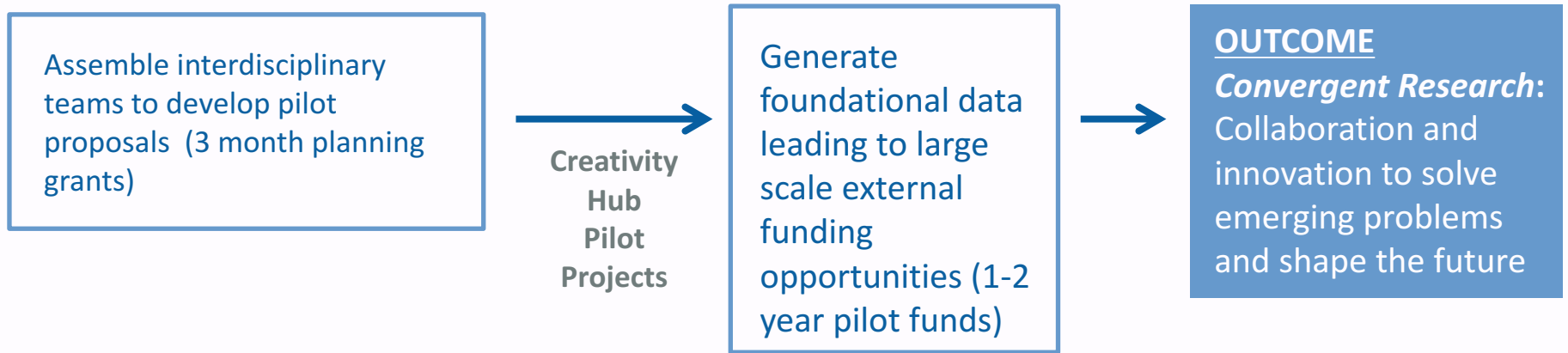
**OPPORTUNITY, WELL-BEING
and CULTURE**



**PRECISION HEALTH
and SOCIETY**

Creativity Hubs

An evolving virtual research network that concentrates talent and resources for defined periods of time on bold ideas, free from typical organizational demands and boundaries, with the goal of moving new discoveries and ideas into practice.



Creativity Hub Pilot Award Key Criteria

Innovation - Ability to provide solutions to important challenges and/or generation of new fundamental knowledge and create impact to benefit society, culture, community, the environment, or the economy.

Convergence - Demonstration that the project takes advantage of expertise from multiple and diverse disciplines and promotes new ways of thinking that push disciplinary boundaries.

Sustainability - Likelihood that the project will lead to support of larger and sustained extramural funding from federal agencies, industry, venture groups, or non-profit organizations.

Program Management Plan - Clearly articulated plan with description of feasibility, work-plan, milestones, project deliverables, evidence of alignment with large-scale extramural support and timeline for soliciting external support.

Creativity Hub Pilot Award Features

Awards are for new work that has not been previously funded

Preliminary data are not required but teams must demonstrate that they can successfully advance the project

Projects that align with one or more of the strategic research priorities are encouraged, but projects proposing revolutionary ideas through convergent research in any discipline are also welcome

Teams:

- Leader(s) must hold primary faculty appointment in a UNC-CH Department or Center/Institute
- Include researchers from multiple schools/college and/or Centers/Institutes

Process for Award of Pilot funding

Stage 1: Request for Ideas (Pre-Proposal)

- 4 teams awarded up to \$5000 per team for 3 months to build full proposal
- OVCR provides support for further team building, work plans, sustainability plan, and pilot proposal development
- Research Deans and Center/Institute leadership provide recommendations to OVCR for selection of ideas

Stage 2: 4 Pre-proposal teams submit full proposal

- 1 team awarded up to \$250,000 per year for 2 years
- Each team to provide presentation of their proposals
- Research Deans, Center/Institute leadership, and faculty with relevant expertise provide recommendations to OVCR for selection of team for funding

Tracking Progress

- Separate executive committees for each Creativity Hub Pilot Award team to advise/track progress against proposed metrics

Timeline for Creativity Hubs Pilot Award



Pilot Funding Post-Award

Two-Page Report describing accomplishment, progress against pre-defined metrics, and financial accounting of fund expenditures due prior to year 2 funding

- Executive committee makes recommendations and VC of Research makes final decision regarding release of funds for Yr2 of funding

Final report due 2 months after the final year of Funding

ORD will provide proposal development support for large-scale follow-on awards that spring from Creativity Hub funding

Awardees may be called upon to develop and deliver presentations of projects suitable for campus leadership and lay audience

Creativity Hubs

Creativity Hub website, <http://research.unc.edu/creativity-hubs/>

Information about Creativity Hubs

RFP and submission links

