Data Science and Health

Ghada El-Hajj Fuleihan, MD, MPH

#AUBWiDS18
Data Science and Health

• Health is the most precious asset we as individuals and society possess

• “Health is Wealth” and a transformative change in the environment is upon us

• In 2050 there will be 9.7 billion persons on our planet. This combined with increasing longevity will incur immense costs on our society
Apple Health iOS

BIG DATA

IBM Watson

APP BASED REAL TIME PERSONAL DATA

ELECTRONIC MEDICAL RECORDS: EPIC

SMART PHONES APPS

ARTIFICIAL INTELLIGENCE
Limits to Precision Cancer Medicine

Michael Fernandes, M.D.
Medbase
Chapel Hill, NC
Daniel Rosel, Ph.D.
Jan Brabeck, Ph.D.
Charles University
Prague, Czech Republic
brabeck@natur.cuni.cz

Research Article
Genomic structural variations lead to dysregulation of important coding and non-coding RNA species in dilated cardiomyopathy
Jan Haas 1,2, Stefan Mester 1,2, Allan Lai 3, Karen S. Fresa 1, Farbod Sedaghat-Hamedani 1,2, Eilam Kayanpour 1,2, Tobias Rauch 1,4, Bouwen Nieh 1,2, Jen-Noel Bocekl 1,2, Aihua Canters 1,2, Mirko Völkers 1,2, Carsten Dietrich 1, Dietmar Pfahler 1,2, Ali Am 1,2, Daniel B. Holzer 1,2, Diana Martins Bordalo 1,2, Daniel Oehler 1,2, Tanja Weis 1,2, Delitz Merelles 1,2, Sebastian Buss 1,2, Eva Rechert 1,2, Emil Winz 1,2, Maximilian Wurst 1,2, Jan O Korch 1,2, Andreas Keller 1,2, Hugo A Katus 1,2, Andreas E Posch 1,2 & Benjamin Meisinger 1,2
EMBO Mol Med 2018;10: 107-120

Altered TERT promoter and other genomic regulatory elements: occurrence and impact
Barbara Helleder 3 & Ralf Kumar 3,2
Int. J. Cancer 2017; 141:867-876

Identification of somatic mutations in postmortem human brains by whole genome sequencing and their implications for psychiatric disorders
Masaki Nihiraoka, MD, PhD,1,2,3 Miki Bundo, MD, PhD,4,5 Junko Ueda, MD,5 Fumiki Kanatsuka, MD,5 Yukuto Sato, MD, PhD,5 Yoko Kuroki, MD, PhD,5 Takao Ishii, MD, PhD,5 Wataru Uka, MD, PhD,5 Shigeki Murayama, MD, PhD,5,8 Eri Hashimoto, MD, PhD,5,9 Masato Nagasawa, MD, PhD,9 Jun Yasuda, MD, PhD,10 Kiyoto Kasai, MD, PhD,10 Tadafumi Kato, MD, PhD,10 & Kazuyuki Iwamoto, MD, PhD,10,9

Over 2,000-5,000 articles/year in Pubmed each for Data Science, Big Data, Personalized Medicine and Precision Medicine
Shaping the Future of Health and Healthcare

Precision Medicine
“Our ultimate vision is a non-invasive blood test that can be used to screen for multiple types of common cancers”  Cohen JD et al Science 2018; doi 10.1126
Data Science and Health

- Data Science will transform the way we teach Life Sciences (medical school curricula will change), the way we as individuals will take charge of our own Health, and how society, including to but not limited to public health officials and physicians, will prevent and treat diseases.

- Data science and technology empower genomics and evidence to “Enhance Health and Accelerate Cure”.

“Data Science and Health”

“To Educate, Guide and Inspire”

- Viviane Tabar, MD.
- Nada Abu Mrad, PhD.
- Jana Al Hashah, MD, MPH.
- Mariette Awad, PhD.
- Kristin Gunsalus, PhD.

#AUBWiDS18
"So that they may have Life and have it more Abundantly"

"UT VITAM HABEANT ABUNDANTIUS HABEANT"