TURKEY in HORIZON 2020
COOPERATION, INNOVATION, COMPETITIVENESS

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# International Study Visit, CERTH, Greece 11-13 Feb 2020

## *Middle East Technical University*

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REPUBLIC OF TURKEY
MINISTRY OF INDUSTRY
AND TECHNOLOGY

TÜBİTAK

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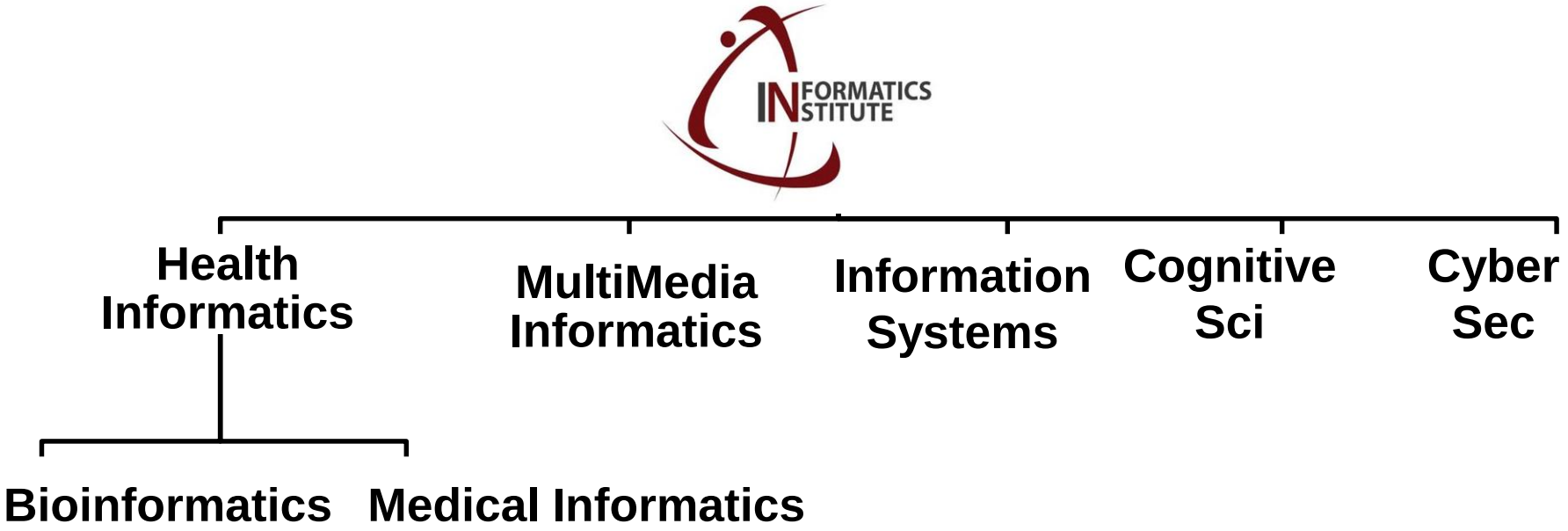
# METU Informatics Institute



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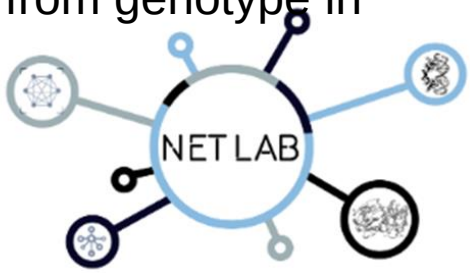
# Research Interests: Network Modeling Group

- We conduct interdisciplinary projects to deliver a “precision medicine” approach by leveraging sophisticated computational methods using graph theory, optimization and graph visualization to integrate multi-omic and diagnostic data.

  – 6 PhD, 3 MS students, several undergrads
  – Bioinformatics and Computational Personalized Medicine
    - Integrative graph analysis and optimization
    - Learning-based approaches to predict phenotype from genotype in diseases.
    - Network visualization



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# R&D References

- OpenMultiMed / COST Action / secondary proposer/ http://openmultimed.net/
- FP7 Co-funded Brain Circulation Scheme
- UNESCO-L'Oreal International FWIS Fund – awarded for excellence in Bioinformatics
- ERC Consolidatior (Submitted, under review): Leveraging Molecular Signatures of Cancer to Guide PERSONAlized Therapeutic Strategies
- TUBITAK projects

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# "Computing Cancer"

- "Computing Cancer" has been highlighted among the "Technologies to Watch in 2020" by *Nature.*

- My research group develops computational frameworks to transform patient driven big data into advances in personalized medicine.

- We are interested in cells and the events that alter in disease condition within the cell.

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# "Computing Cancer"


Normal Network

Tumor Network

Revealing how the cellular networks are altered in cells during cancer.

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# Specific Topics and Calls

- SC1-DTH-02-2020: Personalised early risk prediction, prevention and intervention based on Artificial Intelligence and Big Data technologies
- SC1-BHC-17-2020: Global Alliance for Chronic Diseases (GACD) - Prevention and/or early diagnosis of cancer
- SC1-BHC-06-2020: Digital diagnostics – developing tools for supporting clinical decisions by integrating various diagnostic data
- SC1-DTH-12-2020: Use of Real-World Data to advance research on the management of complex chronic conditions

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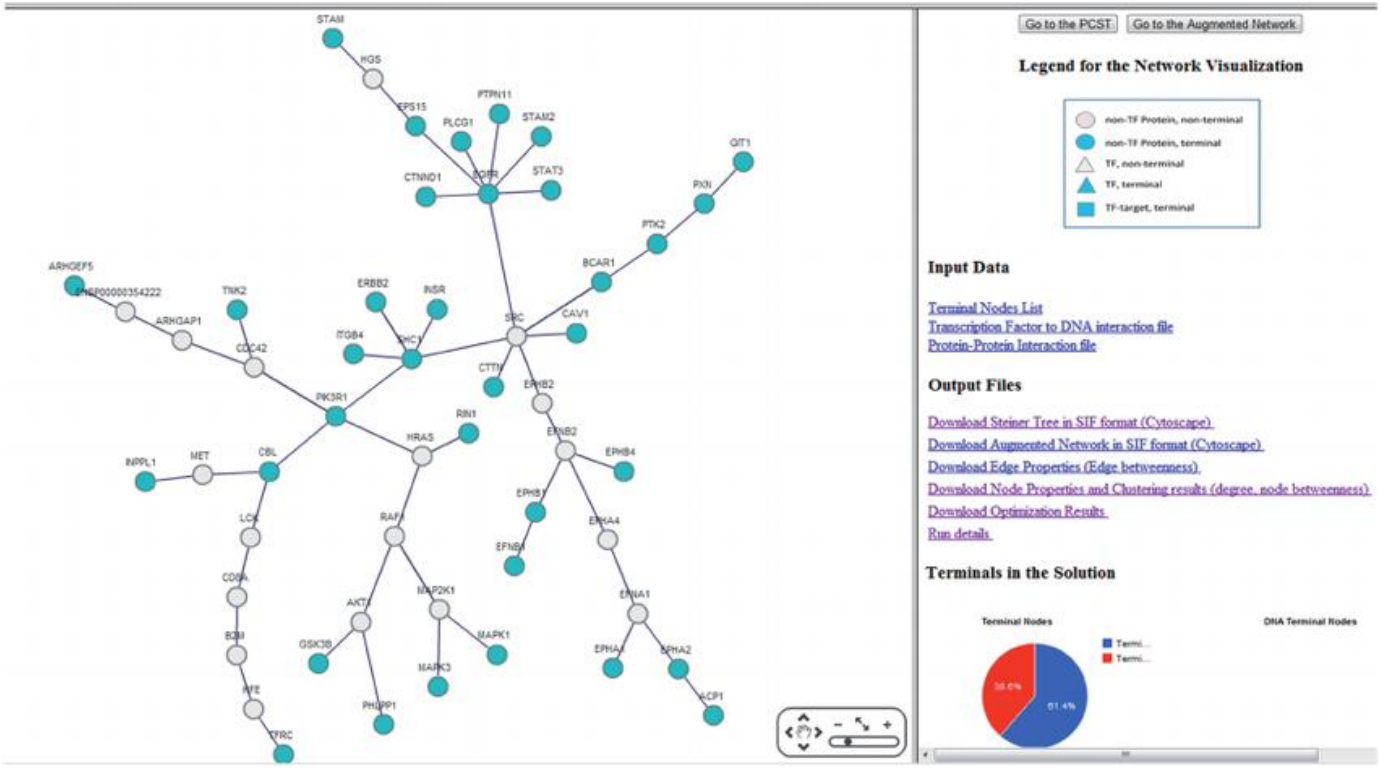
# Developing Integrative Modeling Frameworks

Omics Integrator




International Study Visits of TARAL to EU Key Players

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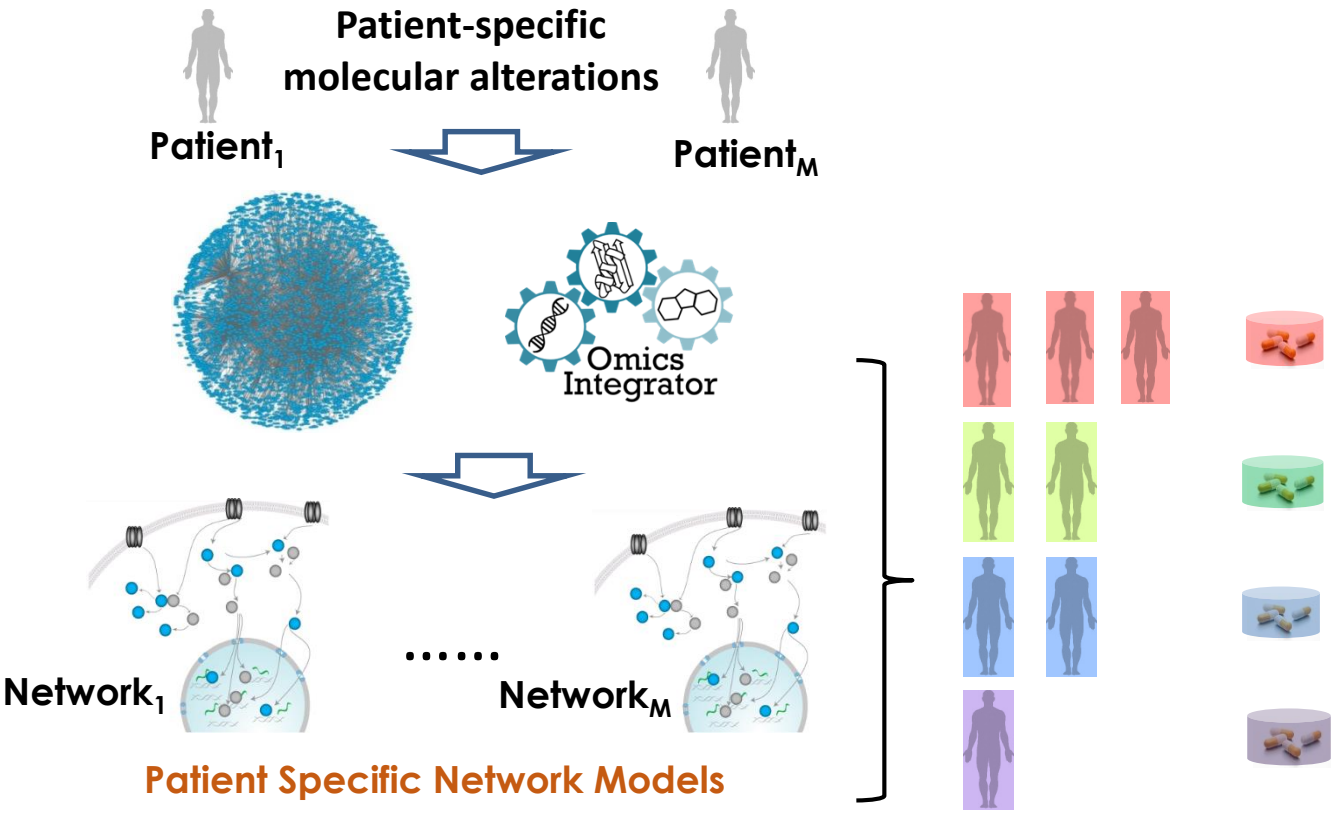
# Network-guided Patient Stratification




International Study Visits of TARAL to EU Key Players

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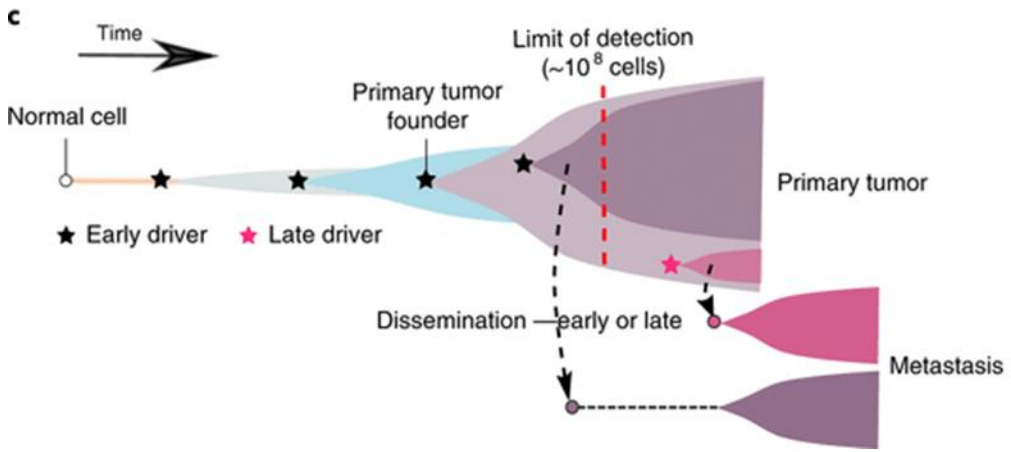
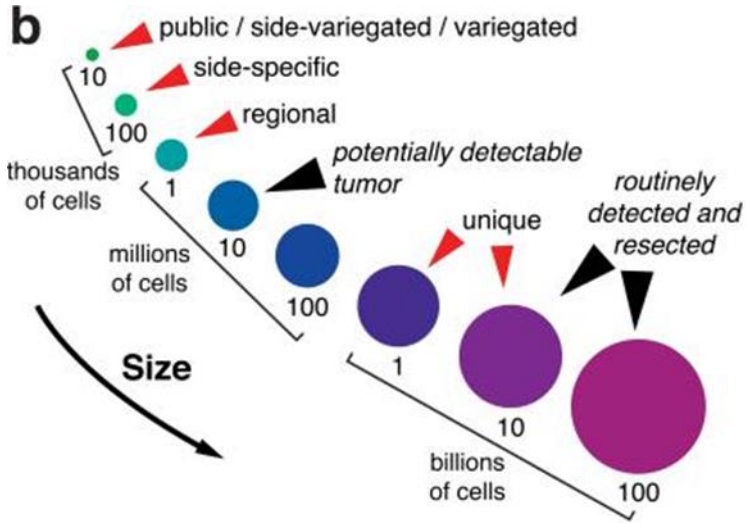
# Accumulation of Molecular Alterations




Curtis and colleagues, Nat Gen, 2019

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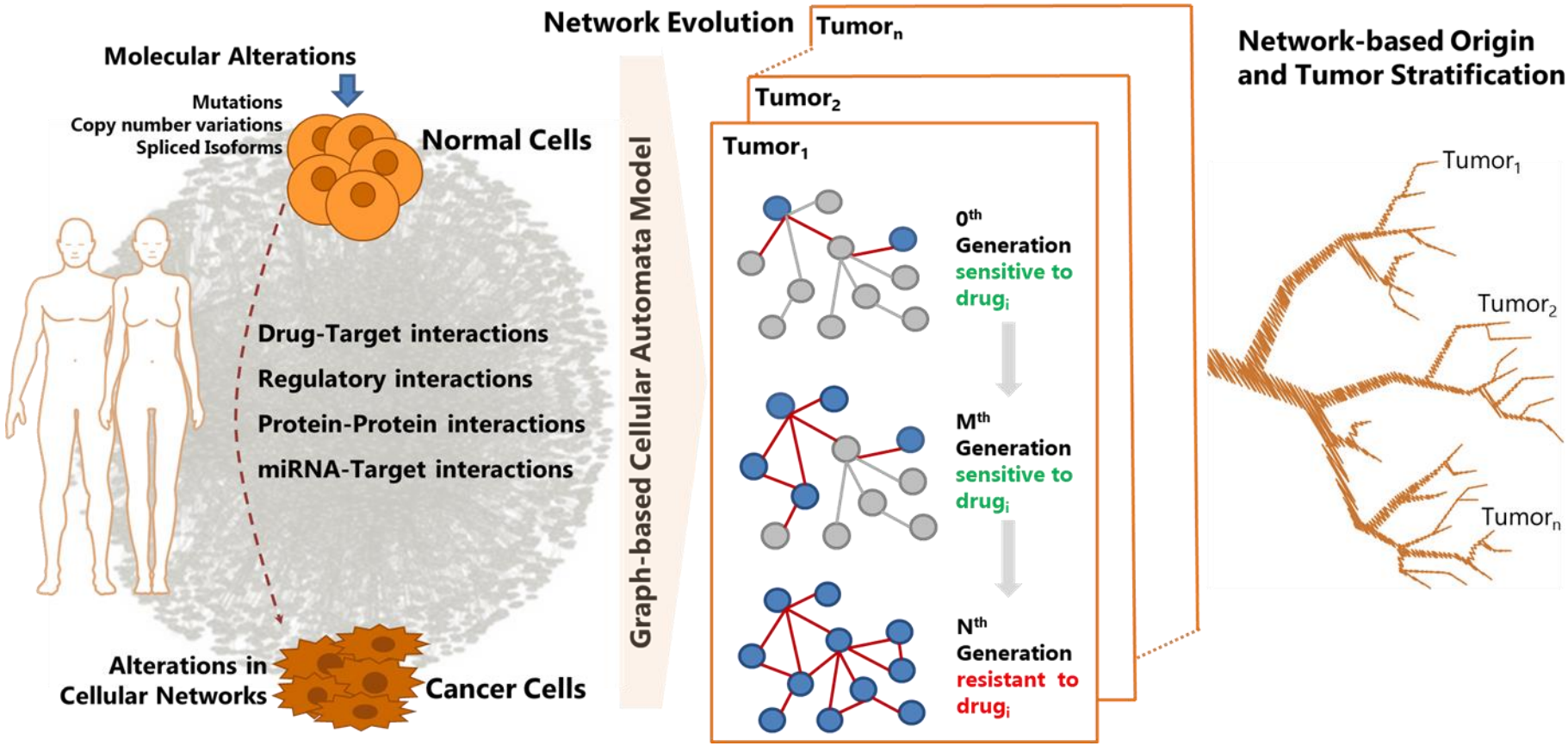
# Dynamic Cellular Graph



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# Collaboration Offer

**We are looking for partnership:**

- We would like to contribute with our computational frameworks and developing new ones for
  - early diagnosis of cancer at molecular level.
  - accurately stratify patients to optimize treatment strategies
  - revealing drug resistance mechanisms.
- These frameworks are adaptable to other diseases, i.e. neurodegenerative diseases, rare diseases.

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