THE MURDOCK Study:
Disease Reclassification Through Advanced Biomarker Discovery and Integration with Electronic Health Records

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Abstract

While new technologies and analytical approaches have enabled the vision for targeted medicine, much work remains to translate the vision into reality. One important step, addressed in a recent National Research Council report, will be the development of a new taxonomy of disease, based not on macroscopic symptoms and observations, but rather on underlying molecular pathophysiology.

Centered in Kannapolis, NC, the M.U.R.D.O.C.K. Study (Measurement to Understand Reclassification of Disease Of Cabarrus/Kannapolis) is a long-term epidemiological study that combines best-in-class clinical research, statistical, and analytical methods with different omics technologies and electronic health records. Using a multi-disciplinary, team-science approach, the MURDOCK Study aims to reclassify the reality of targeted medicine—delivery of the right intervention to the right patient at the right time.

Approach

Use molecular level data analysis for scientific discovery:
- Predictive biomarkers
- Stratification of disease states previously considered a single entity at a macroscopic level
- Commonalities among diseases previously considered to be mechanistically distinct
- Systems biology exploration of molecular pathways and analysis of molecular interactions with respect to disease state or response to treatment

Discussion

Utility of the tools and data assets generated through each horizon of the MURDOCK Study will be measured in terms of uptake by the research community and generation of currency ranging from impact in peer review publication, to products launched from commercial sector collaboration. The authors invite interested investigators to take full advantage of this rich and innovative resource by contacting the MURDOCK Study team (murdock-study@duke.edu) to explore opportunities for collaboration.