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Development of Image / Imaging Based Prognostic Biomarkers

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A biomarker is defined as a characteristic that is objectively measured and evaluated as an indicator of a normal biologic process, pathologic process, or response to a therapeutic intervention. Objective measurement of such characteristics especially in images needs accurate quantification of complex content. The adoption of image analysis for medical imaging applications has grown rapidly in the last years. This is due to the implementation of powerful imaging acquisition methods, advancements in software and computer processing capacity and the increasing importance of image based research for biomarker discovery and stratified medicine. A Quantitative Imaging Biomarker is for example defined as an objectively measured characteristic, derived from a medical image that can be correlated with anatomically and physiologically relevant parameters including disease presence, disease severity, disease characterization (particularly on a molecular level), predicted disease course (both with and without treatment), and treatment response. A variety of image analysis algorithms including morphometry, architecture and context quantification are used for the evaluation of such new imaging biomarkers. This evolution has occurred in parallel with advancements in our understanding of the molecular background of disease and the development of powerful computer algorithms for integration and analysis of large amount of multimodal and multisource data.

Dr. Maria Athelogou is Co-Inventor of the Definiens Cognition Network Technology and the Definiens Image Data Analysis & Co-registration Software Platform. She released several publications and patents. Her work has a focus on interdisciplinary teamwork for the development of computer-based data analysis, imaging- and image based prognostic and predictive biomarkers, monitoring and diagnostic methods, models and simulations for complex natural systems and particularly for Medical, Biological and Pharmaceutical Systems.

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