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The "4D Biology Workshop for Health and Disease", held on 16-17th of March 2010 in Brussels, aimed at finding the best organising principles for large-scale proteomics, interactomics and structural genomics/biology initiatives, and setting the vision for future high-throughput research and large-scale data gathering in biological and medical science. Major conclusions of the workshop include the following. (i) Development of new technologies and approaches to data analysis is crucial. Biophysical methods should be developed that span a broad range of time/spatial resolution and characterise structures and kinetics of interactions. Mathematics, physics, computational and engineering tools need to be used more in biology and new tools need to be developed. (ii) Database efforts need to focus on improved definitions of ontologies and standards so that system-scale data and associated metadata can be understood and shared efficiently. (iii) Research infrastructures should play a key role in fostering multidisciplinary research, maximising knowledge exchange between disciplines and facilitating access to diverse technologies. (iv) Understanding disease on a molecular level is crucial. System approaches may represent a new paradigm in the search for biomarkers and new targets in human disease. (v) Appropriate education and training should be provided to help efficient exchange of knowledge between theoreticians, experimental biologists and clinicians. These conclusions provide a strong basis for creating major possibilities in advancing research and clinical applications towards personalised medicine.

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