Brainstorming Meeting on "Exascale Computing in Life Sciences"

On July 20, 2023, the HPC: Medical and Bioinformatics Applications Group at C-DAC, Pune, organized the first brainstorming meeting on "Exascale Computing in Life Sciences - Vision & Strategy for India." Researchers, scientists, and experts from leading national institutes across India in the field of life sciences and high-performance computing discussed the potential of exascale computing to solve advanced life sciences research problems. They focused on advancements in fields such as genomics, systems biology, precision medicine, and traditional approaches like Ayurveda.

Exascale computing promises to enable data-driven discoveries by empowering computational biology researchers to perform large-scale data mining. It has the potential to transform areas such as unraveling the hidden patterns in multi-omics datasets, biomarker discovery, and complex biological network analysis. The brainstorming meeting saw participants engage in intense discussions and presentations on the possibilities and challenges of harnessing exascale computing for life sciences research.

Padma Bhushan Dr. Vijay Bhatkar, who gave the opening remarks, highlighted the background of the work done under the National Supercomputing Mission (NSM). He emphasized the importance of collaboration and the transformative impact of exascale computing on life sciences research. He also stressed the need for exascale computing to understand computational Ayurveda in identifying phytochemicals that target specific drug targets and understanding their probable mechanism of action.

Distinguished advisors, researchers, and faculty members from the parent ministry and renowned national institutions, such as Smt. Sunita Verma from MeitY, Govt. of India, Shri. E. Magesh, Director General of C-DAC, Col. A. K. Nath (Retd.), Executive Director of C-DAC Pune, and Dr. Hemant Darbari, Mission Director of NSM, presided over the brainstorming sessions and provided their valuable insights. They shared their insights on how to leverage exascale computing to decipher complex biological processes and develop novel solutions to address pressing healthcare challenges.

The session on the "Need for HPC in Life Sciences" was chaired by Professor Alok Bhattacharya of Ashoka University, Sonepat. Dr. Rajendra Joshi, Senior Director and Head of the HPC: M&BA Group at C-DAC, Pune, Dr. Debasisa Mohanty, Director of the National Institute of Informatics (NII) in New Delhi, and other eminent scientists presented the need for exascale computing to facilitate their research areas. The session for beneficiaries of the supercomputing facility at C-DAC was chaired by Dr. Chetan Gadgil of the National Chemical Laboratory (NCL) in Pune. Distinguished scientists from across the nation discussed and endorsed the need for establishing an exascale computing facility at C-DAC.

The brainstorming meeting concluded with a renewed commitment to foster greater collaboration between the life sciences and high-performance computing (HPC) domains. The meeting facilitated fruitful discussions and interactive sessions, where researchers shared their latest findings, showcased innovative technologies, and established promising collaborations. Attendees unanimously expressed their enthusiasm for future partnerships to unlock new computationally intensive frontiers in bioinformatics and drive groundbreaking discoveries in healthcare and medicine.