SELECTED AREAS IN COMMUNICATIONS: MOLECULAR, BIOLOGICAL, AND MULTI-SCALE COMMUNICATIONS

SAC CHAIR

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SCOPE AND MOTIVATION

New communications systems are approaching the possibility of interacting with biological processes using molecules, paving the way to the interface with digital systems, and establishing an exciting area in telecommunications. Since information representation using molecules, as well as their propagation and control, are ongoing studies, novel solutions for molecular communications systems (MC) are still needed while integrating nanobio technologies, natural/synthetic biology, and nanomaterial engineering. Exciting applications of this new communication technology are expected to facilitate interdisciplinary applications, and as one example, dive into biomedical engineering solutions for revolutionizing medicine with engineering of biological communications for remote or in-situ diagnosis and treatment of diseases with precision, personalization, and possible regeneration capabilities. Moreover, the need for less detrimental environmental effects may allow further exploration of molecular communications in the pharma industry investigating the optimization of drug delivery, discovery, and development.

The IEEE Globecom MBMC track is focused on showcasing the most recent exciting contributions in the molecular, biological, and multi-scale communications. We are seeking contributions in the design, analysis, implementation, and theory of molecular communications systems for biological, chemical, and sub-micro physical domains. Contributions are encouraged to be interdisciplinary in its nature, and from a diverse set of disciplines. Applications of MC are also welcomed including, but not limited to the areas of biomedical sciences, biotechnology, bioengineering, synthetic biology, and others. This track, in this year, also aims to provide support for contributions in both theoretical and experimental areas, providing a balance for the exciting future of this community.

TOPICS OF INTEREST

Original research articles are solicited in, but not limited to, the following topics of molecular, biological, or multi-scale communications:

- Active or passive transport molecular communication (e.g., diffusion, flow, microfluidic, motor-assisted)
- Context information for molecular communications
- Mobile molecular communications
- Biological data storage and computing (e.g., DNA, ions)
- Biochemical or biophysical signaling and computing
- Communication between and within natural and/or synthetic organisms
- Intra-body communication systems using neurons, cardiac cells, and other body cell types
- Synthetic or systems biology
- Internet of BioNano Things and Biocyber interfaces
- Abnormality detection and localizations

Submissions are expected (without limitation) to make contributions in at least one of the following areas:

- Channel modelling, characterization and simulations
- Laboratory experiments or testbeds: ranging from inorganic to organic compounds
- Interface and control between communication systems in different physical/chemical domains
- Synchronization, routing, and other higher layer communication techniques
- Transmitter and receiver design or analysis, including modulation, detection, estimation, and coding techniques
- Performance analysis with: Information-theory principles, dynamical system metrics, control theory principles, and similar.

IMPORTANT DATES

Deadline for paper submission: 1 April 2024

Date for notification: 1 August 2024

Deadline for final paper submission: 1 September 2024

SUBMISSION INSTRUCTIONS

All papers for technical symposia should be submitted via EDAS through the following link:

https://edas.info/N31445