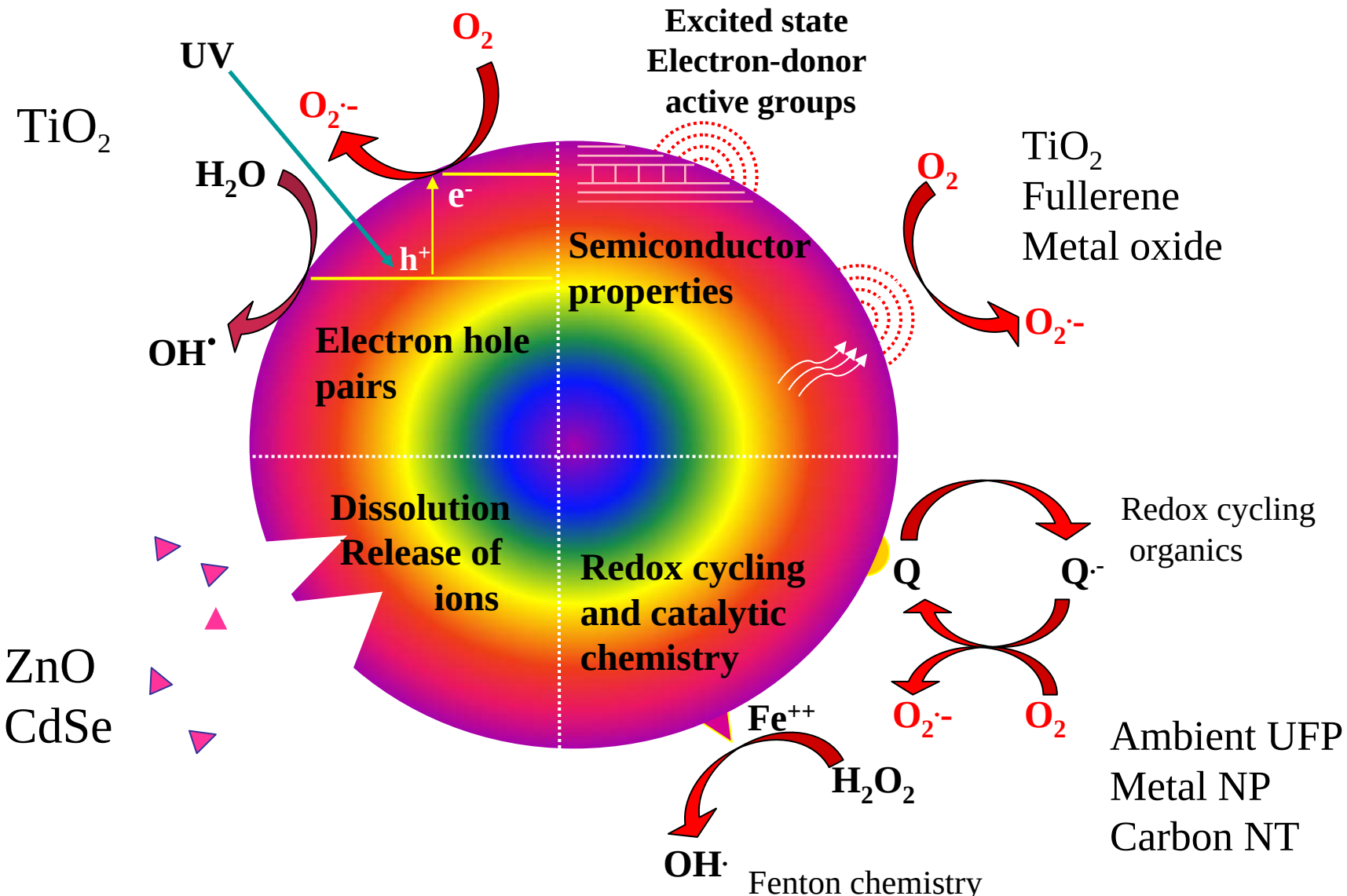
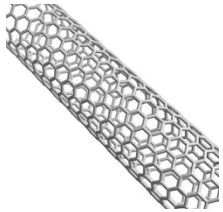
Nanomaterial Mechanisms for Oxygen Radical production

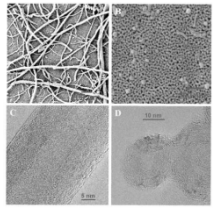


NSF: EF-0830117

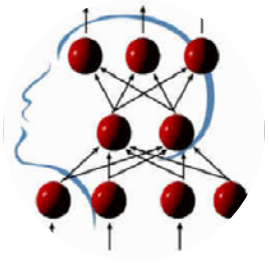
UC CEIN Predictive and Multi-disciplinary Toxicology model

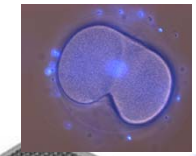
ENM libraries

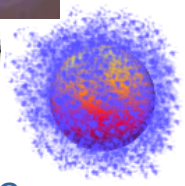




Nanoparticle structural & physicochemical information

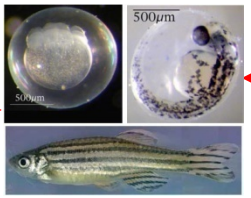






Cell, embryo, biomolecules

- Data integration
- Pattern Recognition (heatmaps, self –organizing etc)
- Machine Learning
-



In vivo toxicity

Predictive toxicology

- Hazard ranking
- Risk profiling
- Exposure modeling
- Property-activity relationships

Fate & transport

Multimedia Analysis

Legend for the previous figure:

UC CEIN uses a predictive multi-disciplinary model for hazard ranking and risk profiling. Predictive science refers to each scientific discipline performing research that predicts or informs every other discipline what those investigators may expect to find if they utilize a common set of compositional ENM libraries as well as materials that are made to systematically vary property or property sets to study biological effects at cellular, organism and population level. An attempt is made to elucidate cellular, bacterial, yeast or embryo stress responses, including through high throughput screening, that are also relevant to whole organisms that are being studied at increasing trophic level in freshwater, seawater and terrestrial mesocosms. Fate and transport assessment as well as multi-media modeling are performed to determine how the alteration of the primary material properties in response to real-life environmental media may contribute to ENM spread, exposure, bio-accumulation and bip processing. Computational biological and computerized decision tool are involved in data integration for purpose of hazard ranking, exposure modeling, risk profiling and construction of property-activity relationships.