

Cellular and Molecular Mechanisms of ASD

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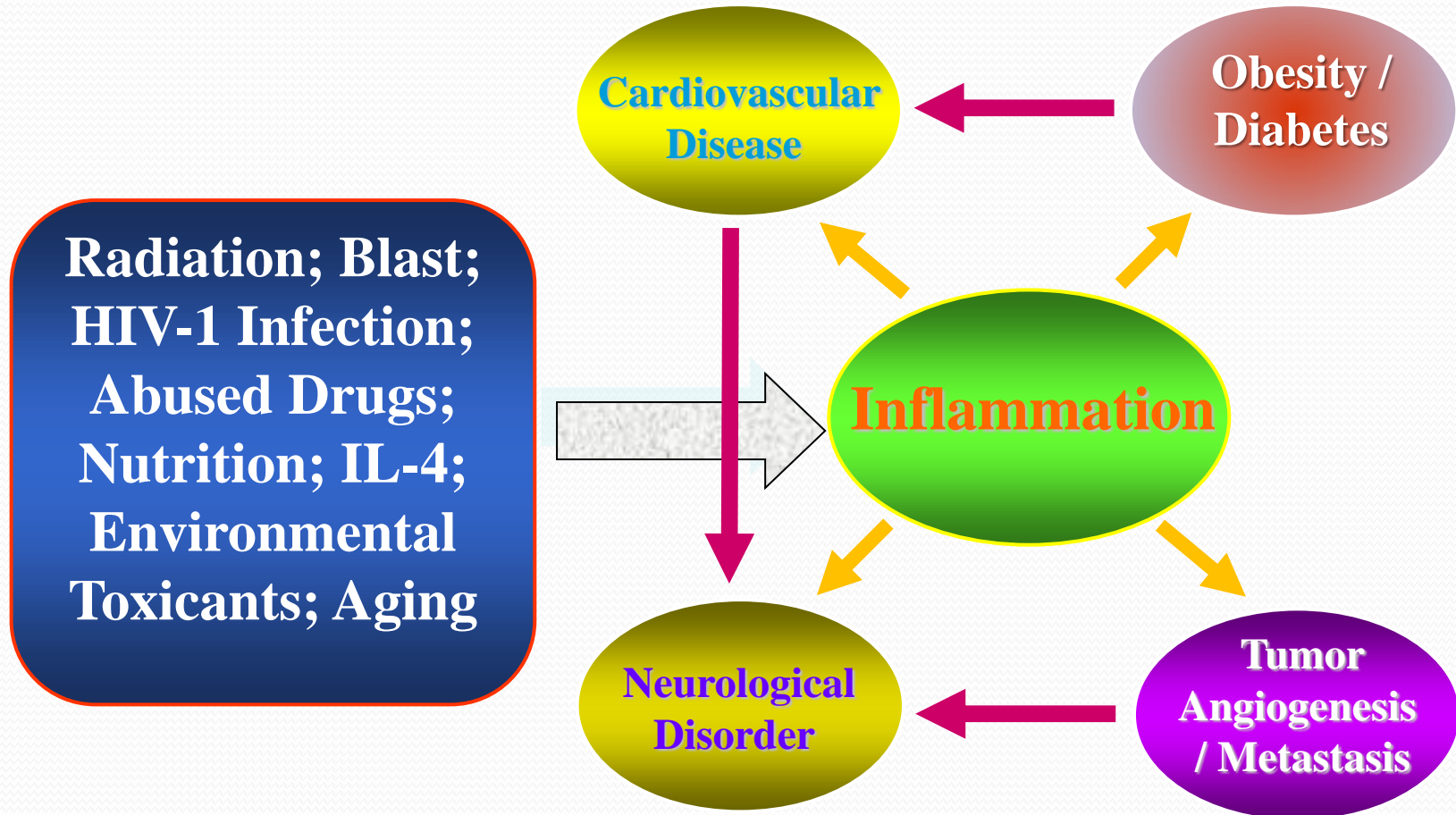
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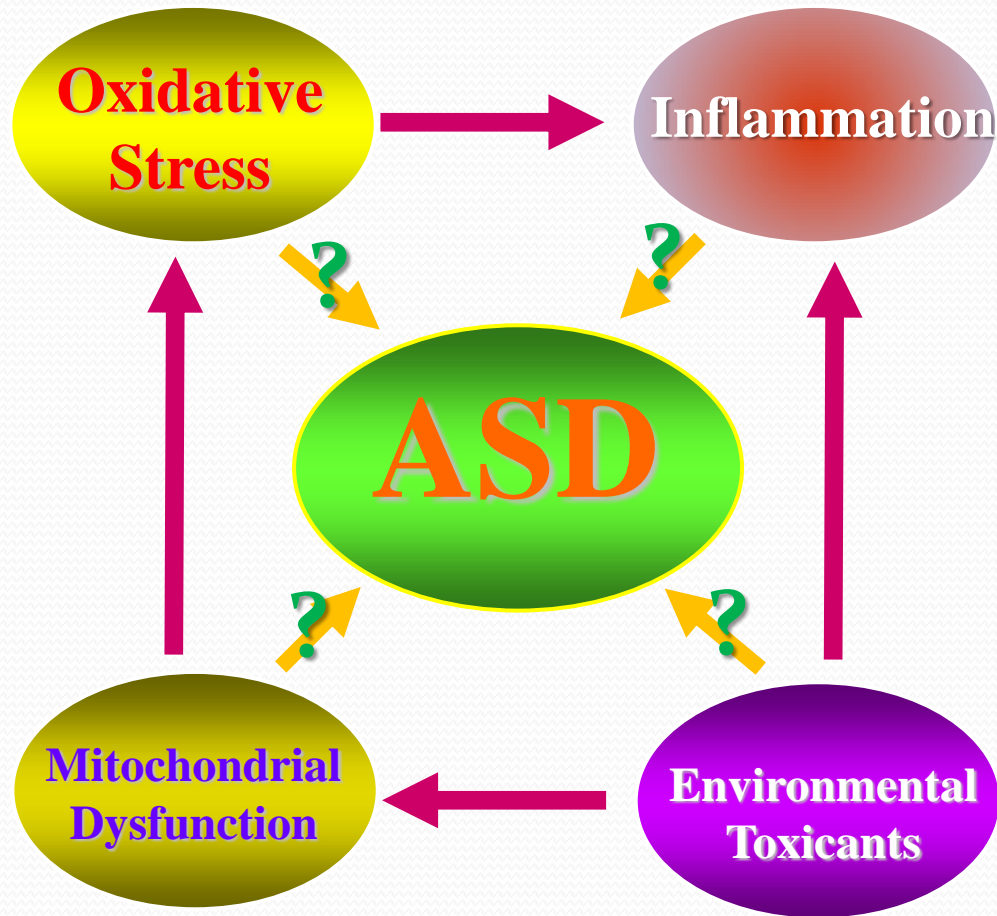
<http://www.vascular.sbes.vt.edu/>

Area of Research



Inflammation is A Common Mechanism
of Human Disease.

Findings to Date



Pathophysiological Mechanisms of ASD

Multidisciplinary Autism Research

- **Understand basic cellular and molecular mechanisms of ASD in an animal model of autism**
 - Pro-oxidative pathways in brain in an animal model of autism
 - Pro-inflammatory pathways in brain in an animal model of autism
 - Mechanisms of blood-brain barrier (BBB) disruption in an animal model of autism
- **Identify biomarkers and therapeutic targets for early detection and treatment of ASD in an animal model of autism**
 - Determination of pro-oxidative and pro-inflammatory biomarkers
 - Determination of therapeutic efficacy of anti-oxidants and anti-inflammatory drugs
- **Translate basic science discoveries into clinically effective therapy for human ASD patients**
 - Evaluation of biomarkers
 - Evaluation of anti-oxidative and anti-inflammatory therapy

Current Working Relationships with **Resources Available**

- **Animal Facility:**

Center for Molecular Medicine and Infectious Disease at Virginia Tech

- **School of Biomedical Engineering and Sciences:**

Well-equipped laboratory space, Shared equipment (e.g., autoclave, water purification system, ice maker, etc.), and Office at ICTAS 1 Building.

- **Laboratory of Vascular Biology:**

3 graduate students and 2 undergraduate students

- **Current Funding:**

1 NIH and 2 NSF grants

- **Current Research Collaborations (Selected):**

- University of Oklahoma Health Sciences Center – Dr. William Sonntag
- Virginia Tech-Wake Forest University – Dr. Pamela VandeVord
- Konkuk University (Seoul, South Korea) – Dr. Jung-Soo Han
- Virginia Tech – Dr. Luke Achenie

Collaborations and Resources Needed

- **Basic Mechanistic Studies:**
 - Expertise and core facility in the design, implementation, and analysis of behavioral experiments in an animal model of autism
 - Expertise in mathematical/computational modeling related to development of therapeutic approaches for ASD
- **Human Clinical Studies:**
 - Expertise in recruitment of ASD patients
 - Expertise in evaluation of biomarkers (e.g., blood withdrawal, brain functional or molecular imaging, etc.)
 - Expertise in evaluation of therapeutic efficacy (e.g., diagnosis of different levels of ASD patients)
- **Funding for pilot work in both basic and clinical studies**