Inflammatory processes are involved in pathogenesis of many diseases, including atherosclerosis, brain infarction, traumatic brain damage, diabetic complications and Alzheimer’s disease. We have been trying to find a cutting edge of inflammatory responses, especially focused on the initiation of inflammation by damage-associated molecular patterns (DAMPs). We hypothesized that there might be intermediate acceptor systems for DAMPs and PAMPs. An increasing evidence suggests that these factors may form a diverse range of complexes in combination and play functional roles as signaling molecules in extracellular space. The recognition of complexes by plasma membrane receptors is not clear at present, however, the signaling processes may provide a therapeutic strategy for the treatment of inflammatory diseases. We are interested in the identification of novel DAMPs and their recognition by inflammatory cells. The following research projects are in progress in our laboratory now.

**Main themes in Pharmacology**

2. Analysis of the interaction between RAGE and its ligands and development of drugs interfering with the interaction.
3. Mechanism for blood-brain barrier disruption by brain inflammation and development of its prevention method.
4. Regulation of neutrophil activity and its application for inflammatory diseases including sepsis.
5. Searching for novel DAMPs and their acceptors as the therapeutic targets.

**References**

- Wake H et al., EBioMedicine, 2016.
- Zhang et al., Stroke, 2011.