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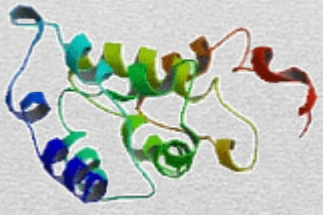
Grzegorz Sowa

Biography

Dr. Grzegorz Sowa is an Associate Professor in the Department of Medical Pharmacology and Physiology at the University of Missouri (Columbia, MO). He received his Ph.D. in Biological Sciences from the Institute of Pharmacology, Polish Academy of Sciences, Krakow, Poland. He completed a postdoctoral fellowship in Neuroimmunology and Host Defense Laboratory, University of Minnesota (Minneapolis, MN) and in the Department of Pharmacology Yale University (New Haven, CT), where he later worked as Associate Research Scientist before joining University of Missouri in 2005. He is a recipient of the Scientist Development Grant and Grant-in Aid from the American Heart Association as well as an RO1 grant from the NIH. He has published in various peer reviewed journals, including British Journal of Pharmacology, Biochemical Pharmacology, PNAS, JBC, Circulation Research, ATVB, Biochemistry, AJP-Cell Physiology, Molecular Cell Proteomics, FEBS Letters and Cancer Research. He has also reviewed for numerous peer-reviewed journals and is a member of the Editorial Board for Frontiers in Vascular Physiology, Journal of Pharmaceutical Technology and Drug Research and International Journal of Bioorganic Chemistry & Molecular Biology.

Research Interest

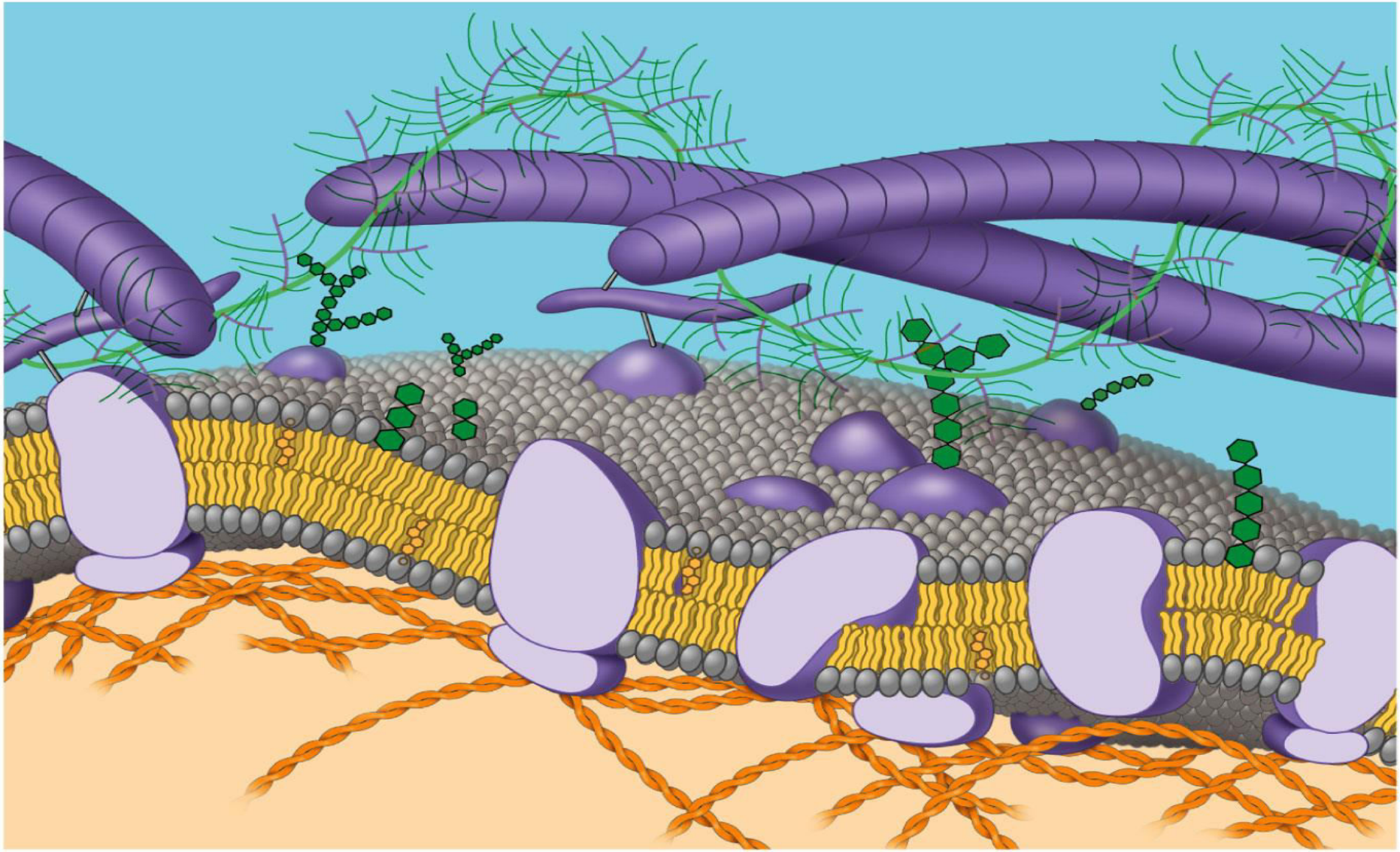
The main focus of Dr. Grzegorz Sowa's research is to understand the role of a membrane spanning protein caveolin-2 in regulating cell function. In particular, he is interested in molecular and cellular mechanisms via which caveolin-2 regulates tumor progression, angiogenesis and inflammatory processes.



Membrane Proteins and Their Functions

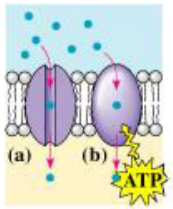
- A membrane is a collage of different proteins embedded in the fluid matrix of the lipid bilayer
- *Proteins determine most of the membrane's specific functions*
- **Peripheral proteins** are not embedded
- **Integral proteins** penetrate the hydrophobic core and often span the membrane

Membrane Protein Function

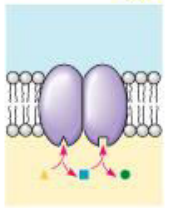


Protein function

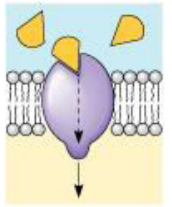
- Plasma membrane proteins serve diverse functions including:
  - Transport
  - Enzymatic activity
  - Signal transduction
  - Intercellular joining
  - Cell-cell recognition
  - Attachment to the cytoskeleton and extracellular matrix



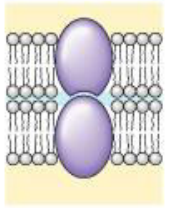
Transport (a) A protein that spans the membrane may provide a hydrophilic channel across the membrane that is selective for a particular solute. (b) Some transport proteins hydrolyze ATP as an energy source to actively pump substances across the membrane.



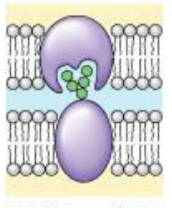
Enzymatic activity A protein built into the membrane may be an enzyme with its active site exposed to substances in the adjacent solution. In some cases, several enzymes in a membrane are ordered as a team that carries out sequential steps of a metabolic pathway.



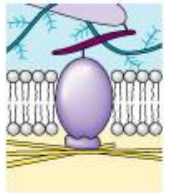
Signal transduction A membrane protein may have a binding site with a specific shape that fits the shape of a chemical messenger, such as a hormone. The external messenger (signal) may cause a conformational change in the protein that relays the message to the inside of the cell.



Intercellular joining Membrane proteins of adjacent cells may be hooked together in various kinds of junctions (see Figure 7.30).



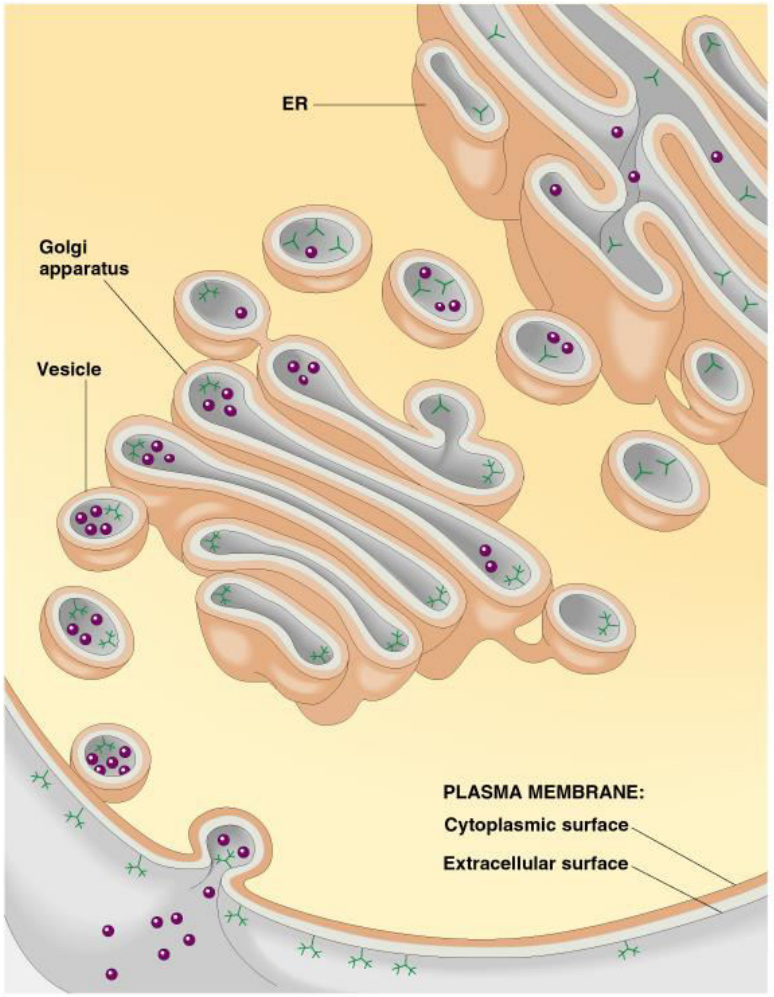
Cell-cell recognition Some glycoproteins (proteins with short chains of sugars) serve as identification tags that are specifically recognized by other cells.



Attachment to the cytoskeleton and extracellular matrix (ECM) Microfilaments or other elements of the cytoskeleton may be bonded to membrane proteins, a function that helps maintain cell shape and fixes the location of certain membrane proteins. Proteins that adhere to the ECM can coordinate extracellular and intracellular changes.

Carbohydrates diversifv membranes

- Membrane carbohydrates are only found on the outside (external) face of membranes
- Attach to lipids or protein (glycolipid/ glycoprotein)
- Enable cells to distinguish/ recognize one another

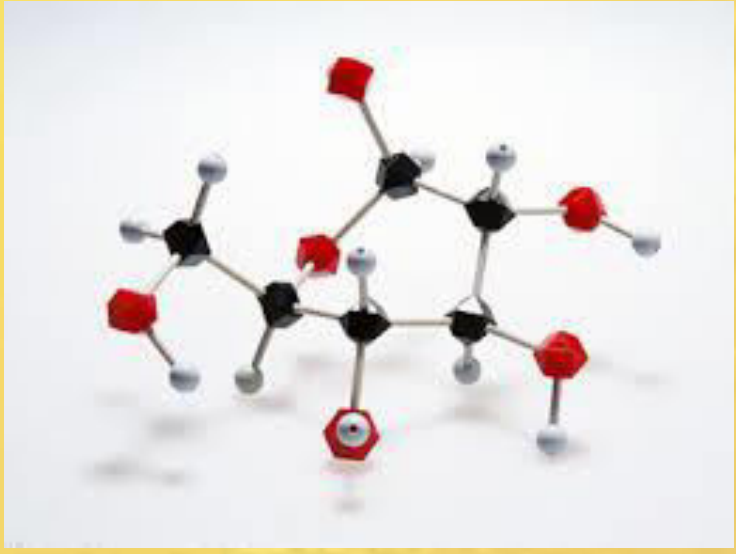


Signature

Grzegorz Sowa

Medicinal chemistry Related Journals

- Drug Designing: Open Access
- Biochemistry & Pharmacology
- Advances in Pharmacoepidemiology & Drug Safety



Medicinal chemistry Related Conferences

- 3rd International Conference on Medicinal Chemistry & Computer Aided Drug Designing
- 3rd International Conference and Exhibition on Pharmacognosy, Phytochemistry & Natural Products

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