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Current advances in inflammatory bowel disease research

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Inflammatory bowel disease (IBD) is a chronic and debilitating gastrointestinal disorder, characterized by excessive inflammation within the gut wall with severe sequelae. In the majority of cases the etiologies of IBD are unknown, and conventional therapies have not been sufficiently effective. In order to improve health-related quality of life and well-being of patients, it is necessary to develop further therapeutic options. In addition to act as an energy source within cells, the purine nucleotide ATP can also be released from cells and functions as an autocrine/paracrine signal, modulating a broad range of cell and organ functions and contributing to disease processes, e.g. inflammation, through activation of purinergic P2X and P2Y receptors. The mechanisms responsible for ATP release have remained unresolved, although considerable evidence suggests that pannexin and connexin channels are ATP permeable conduits for the release of intracellular ATP into the extracellular space. Our new data have shown that pannexin and connexin channels are localised to intestinal epithelial cells and lamina propria immune cells, and mediate stretch- and/or Ca2+-dependent ATP release from human colonic mucosa and epithelial cell lines. We found that the purinergic P2X7 receptor, a key player in proinflammatory interleukin (IL)-1β processing and release, had a similar expression profile, suggesting that ATP released from these channels may act as an autocrine or paracrine molecule to activate P2X7 receptor, and thereby be a key factor underlying inflammatory responses. We also found that the P2X7 antagonist and pannexin-1 channel inhibitor could block TNFα and IL-1β induced reduction in transepithelial electrical resistance. These new findings provide a potential avenue for the development of novel therapeutics that targets P2X7 receptor and ATP release channels.

Biography

Lu Liu completed her PhD in Monash University, Australia in 1998, and received the prestigious Mollie Holman Medal for best PhD thesis. From 1998-2005, she worked as a Post-doctoral research officer and senior research fellow in the gastrointestinal pharmacology research field at UNSW Australia. In 2006, she took up an academic position, became a Lecturer in the same institution and was promoted to Senior Lecturer in 2009. As a Chief Investigator, she has obtained research funding over $2.5 million from various grant bodies to support her research. She has established a track record of quality research outputs. She has published over 50 original research papers in high impact pharmacology, gastroenterology and urology journals and over 130 conference abstracts. Her research has been recognized both nationally and internationally. She received many awards and has been frequently invited to present at the conference symposia and seminars.

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