An internationally renowned medical researcher into pancreatic disease, Professor Minoti Apte’s contribution to the University of New South Wales and the wider community extends well beyond her laboratory. In 2014, she was awarded a Medal of the Order of Australia and she received the 2015 NSW Premier’s Award for Woman of the Year, in recognition of her contribution to medical research, tertiary education and the community. Most recently, her work in pancreatic cancer research was recognised with the Professor Rob Sutherland Make a Difference Award presented at part of the Cancer Institute NSW 2016 Premier’s Awards for Outstanding Cancer Research.

A Professor of Medicine and Director of the Pancreatic Research Group based at the Ingham Institute, Prof Apte is internationally acknowledged as a leading researcher in the field of pancreatic injury and is particularly recognised for her pioneering work in pancreatic fibrogenesis, having been the first in the world to develop a method to isolate and culture pancreatic stellate cells (PSCs). Her Group was the first to establish the role of these cells in the scar tissue of chronic pancreatitis and pancreatic cancer. This scar tissue is responsible for significant pancreatic dysfunction and for cancer progression. Her group was also the first in the world to show that the pancreatic stellate cell helped pancreatic cancers grow and spread, and she is currently leading pre-clinical studies of a new combination therapy to help improve treatment outcomes. Professor has published over 120 research papers, and her work has received over 5700 citations. She is currently the Editor-in-Chief of Pancreatology, one of the two leading journals in the field.

Professor Apte served as postgraduate coordinator within the South Western Sydney Clinical School from 2001-2016, where she nurtured the talent of our PhD, Masters and Honours students, in addition to direct supervision of her own higher degree students. She has served/serves at senior levels on several key committees within the University as well as on committees of national and international organisations relevant to her Discipline.

In addition to her role within UNSW Medicine and the wider discipline of Pancreatology, Professor Apte is an active member of the Marathi Association of Sydney, which serves Sydney’s large Indian population. She is an accomplished Indian classical dancer and choreographer, and has served on the Association’s organising committee, provided programs for community radio, plays an active role organising and performing in cultural events and provides mentorship and career advice to new migrants in her community.
Learning from our scars – the pancreatic stellate cell story

Professor Minoti Apte, OAM

Abstract

The pancreas is a major digestive organ in the body responsible for producing the enzymes essential for digestion of food (exocrine function) and for secreting the hormones responsible for glucose homeostasis (endocrine function). Of all the different exocrine and endocrine cell types in the pancreatic parenchyma, the most recently discovered cell is the pancreatic stellate cell (PSC). PSCs were first described just over thirty years ago, in 1982. It was not until sixteen years later that methods were developed to isolate and culture PSCs, a world-first by our Group and an important step forward towards understanding the cellular biology of this unique cell type. PSCs are now increasingly acknowledged for their crucial roles in both health and disease.

Pancreatitis (inflammation of the gland) and pancreatic cancer are two major diseases of the pancreas that are associated with significant morbidity and mortality. One of the histological features common to both diseases is the abundant scar tissue that replaces normal cells. It is now well established that PSCs are the key effector cells in producing this scar tissue. During pancreatic injury/disease, PSCs are transformed into an activated myofibroblast-like phenotype which synthesizes excessive amounts of matrix proteins that make up fibrous/scar tissue. Thus, PSCs, are activated by factors known to be upregulated during pancreatic necroinflammation (such as cytokines, growth factors and oxidant stress), and play a central role in the fibrosis of chronic pancreatitis. On the other hand, emerging evidence suggests that PSCs may also play a role in the regeneration/repair of the pancreas during recovery from acute pancreatitis. With regard to pancreatic cancer, it is now well known that PSCs not only produce the collagenous (desmoplastic) reaction of pancreatic cancer, but more importantly, they interact closely with cancer cells as well as with other stromal cells such as immune cells, endothelial cells and nerve cells; this cross-talk is thought to influence local tumour growth and distant metastasis.

In view of the demonstrated active role of PSCs in chronic pancreatitis and pancreatic cancer, researchers are now focusing their efforts on the development of approaches/interventions to therapeutically target PSCs so as inhibit/retard disease progression. Several such approaches have shown benefit in experimental settings, although translation of these pre-clinical findings to the clinical situation remains a challenge. It is anticipated that better characterisation of putative pathways modulating PSC function and the use of a variety of in vivo models for testing targeted therapies, will allow the development of effective, clinically applicable treatments to improve outcomes in chronic pancreatitis and pancreatic cancer.