



School of Medical Sciences Seminar Series

Wednesday the 10th of June 2020

3:00 – 4:00pm Microsoft Teams

We ask all attendees to mute and turn off their video

Professor Ross Hannan

“**Non-ribosomal functions of the nucleolus in development and cancer.**”

Bio: Professor Hannan is the ANU Foundation Centenary Chair in Cancer Research, NHMRC PRF and Associate Dean of Research for the College of Health and Medicine, ANU. His research career spans over 25 years of internationally competitive research in Australia and the US, during which he has published over 170 papers focusing on therapeutically targeting ribosomal gene transcription to treat cancer and extra ribosomal roles for the nucleolus in cellular homeostasis. Most recently he brought together multi-disciplinary teams of laboratory and clinician researchers and industry collaborators to devise ‘first in class’ cancer therapies targeting RNA Polymerase I. These drugs are now in phase 1 and 2 clinical trials for a range of human cancers. Professor Hannan has served on numerous medical research boards including as a Director on the Board of the National Breast Cancer Foundation (NBCF) and Chair of the NBCF Scientific Advisory Board and also as Executive Director of Research for the Centre for Health and Medical Research, Australian Capital Territory Health Directorate. Professor Hannan’s medical research and health administrative achievements have been recognised among others, by his election to the Fellowship of the Australian Academy of Health and Medical Sciences



Talk: Nucleoli are the largest structures within the nucleus. They form dynamically around actively transcribing ribosomal genes which are arranged in arrays of tandem repeats at chromosomal domains called nucleolar organizer regions. Nucleoli are traditionally associated with RNA Polymerase I transcription of the ribosomal genes (rDNA) which dictates ribosome biogenesis. It is now clear however, that the nucleolus contributes to a number of functions not strictly linked to ribosome production, but which are never-the-less critical for cellular homeostasis. One such function is the nucleolar surveillance pathway which monitors the fidelity of nucleolar function and induces stabilisation and accumulation of p53 in response to perturbations in ribosome biogenesis. The nucleolar surveillance pathway is frequently dysregulated in cancer and also in a class of inherited diseases associated with bone marrow failure known as ribosomopathies. Professor Hannan will describe his collaborations with the pharmaceutical industry to devise ‘first in class’ therapies targeting RNA Polymerase I to induce the nucleolar surveillance pathway to treat cancer, which are currently in phase 1 and 2 clinical trials. He will also discuss recent work using high throughput functional screening approaches with RNAi and CRISPR/Cas9 to uncover novel components of the nucleolar surveillance pathway as targets to treat ribosomopathies. Finally, he will discuss how the nucleolus plays a critical, but previously unrecognized, role in the dynamic regulation of global gene transcription important for cell fate decisions, through modulation of long-range interactions of RNA Polymerase II encoding genome loci with the nucleolar located rDNA.