Cologne Evolution Colloquium

CRC 1310 Predictability in Evolution

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Deadly proteins and their inflammatory missions in cancer and infectious diseases

In an average human adult billions of cells die each day to counter mitosis. In addition to this quantitative counterbalance which safeguards tissue homeostasis, cell death represents one of the fundamental immune surveillance mechanisms by removing the so-called “unwanted cells” such as infected or malignant cells. Recent discoveries showed that dying cells actively coordinate the fade of the affected tissues by emitting a plethora of different factors that dictate tissue responses ranging from repair/regeneration to collateral tissue damage. Different types of cell death have been characterised, each of which utilises a molecularly distinct death machinery but ultimately converges at the common cell death end point. They however divergently evolve specific tissue responses by secreting distinct molecular patterns. The molecular link between cellular death and immune inflammatory signalling is currently considered as a fundamental process governing tissue functionality and represents the central focus of our group.

It has long been known that alteration of cellular death process is a driver of cancer. Our recent discoveries showed that components of cell death machinery, which have been extensively studied in cancer, serve as central mediators of immunity against pathogens by controlling immune signalling. Our data provided a valuable example of how the molecular knowledge obtained in the context of infectious diseases can be exploited to treat human cancer.

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