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SUMMARY & MISSION STATEMENT

Viruses have been associated with cancer in two ways – as cancer-causing viruses, and cancer-disrupting vectors. Regardless of their effects, all viruses have a dual nature. Particles are 'passive substances' lacking chemical energy transformation processes, whereas infected cells are 'active substances' turning-over energy, and causing disease. How virions (passive substances) convert to infected cells (active substances) has been a long-standing question in my laboratory.

OVERVIEW

How do viruses work, and how can virus vectors be best used in anti-cancer treatments? To address virus-cancer interactions, our research focusses on human adenoviruses, which infect a wide range of cell types. Infection outcome depends on innate and adaptive anti-viral immunity, and the viral use of host cell mechanisms. We engage forward genetics, system-wide analyses of proteins, lipids and nucleic acids, as well as studies of molecules, organelles, cells and micro-tissue. Advanced light and electron microscopy, biochemical and cell biological tests, systems profiling and numerical models further enhance our analyses of viral infection. We additionally have a strong interest in identifying chemical compounds with anti-viral activity, and elucidating their mode-of-action to stop natural infections, and safeguard against uncontrolled outbreak of replicating anti-cancer vectors. Further efforts of my laboratory explore how viruses adapt to a dynamic host environment and to therapeutic pressure, which can occur in cancer therapy, for example. Our studies contribute to a better understanding of how viruses break down the defense barriers of the host. They provide a strong basis for clinical gene therapy, a field, which largely relies on viral vectors.

SELECTED CANCER RELATED PUBLICATIONS

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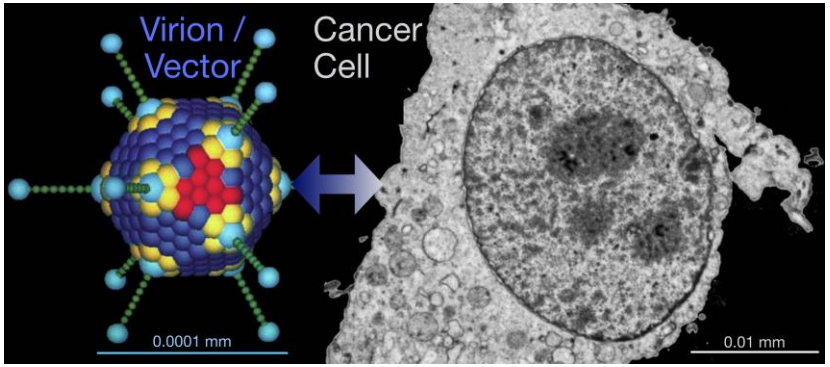

Viruses can cause cancer. Viral vectors can be used to treat cancer.