Taking it to extremes – living in Arctic condiitons makes for novel, applicable chemistry

Plants and terrestrial microorganisms have been a rich source for drug discovery since the introduction of aspirin and penicillin. Now, with pharma wanting to fill their pipelines with new anti-cancer drugs and anti-infectives, the search for novel molecules is turning to cold Arctic waters and even oil reserves. For microbes and invertebrates , known as extremophiles, which can survive such harsh conditions often produce unusual molecular structures to do so – many of which are not found in terrestrial environments.

Norway is one of the leading nations in marine bioprospecting and has set up new biobanks, molecular structural studies, genome projects, and companies (through the publically funded MABIT programme) to explore and exploit these unusual molecules. For instance, Biotec Pharmacon of Tromsø has developed many cold-adapted enzymes for lab use which do not require heat inactivation and have higher catalytic efficiency. However, other countries, such as Scotland and the US also have an interest in marine bioprospecting. Now the Norwegian state oil company (StatoilHydro) is beginning to invest in oil exploration for extremophiles in the hope of getting compounds that can be used as anti-cancer drugs.

People who could be interviewed for this feature

- Hans Kristian Kotlar = Statoil Hydro
- Prof David Newman, National Cancer Institute, USA – the expert on why marine compounds can become anti-cancer drugs, what NCI is doing, and how to obtain compounds from these difficult environments
- Arne Smalas, University of Tromso and Jennifer Littlechild, University of Exeter – how to explore the structure of extremophile enzymes for commercial application