Discovery of antiaging compounds via the screening of Greek actinobacteria

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The Athens University Bacterial & Archaea Culture Collection (ATHUBA) contains a large number of actinobacterial isolates from Greek environments with potential industrial utility. 1000 strains of the ATHUBA culture collection were screened for antiaging activity, more specifically for bacteria producing secondary metabolites capable of inhibiting elastase (which breaks down skin collagen and can cause wrinkles) and tyrosinase (which produces melanin and can cause liver spots). The strains were grown in liquid culture and their secondary metabolites were extracted twice, first with ethyl acetate and then with methanol. The ethyl acetate and the methanol extracts were then tested for inhibition of elastase and tyrosinase using *in vitro* enzymatic assays. The screening data demonstrated that 1.4% of strains produced elastase inhibitors and 26.4% produced tyrosinase inhibitors and that ethyl acetate is a more efficient solvent for extraction of molecules of interest than methanol. The 70 most active of these extracts, were then tested for cytotoxicity on two human cell lines. 30 extracts were found to be non-cytotoxic, and they were then tested for tyrosinase inhibition and for elastase inhibition on cell lines. 3 extracts were found to inhibit tyrosinase and 1 extract was found to inhibit elastase in living cells. These 4 extracts are undergoing fractionation and mass spectrometry in order to identify the active molecules and the most suitable compounds will be used in the manufacture of antiaging skin creams by our industrial partner.