Various diseases, abnormal growths, and conditions can affect the skin and its underlying superficial layers, including cancerous growths such as primary, recurrent, and metastatic melanomas and carcinomas, and non-cancerous conditions like psoriasis plaques, port-wine stains, warts, and superficial cuts and burns. These diseases can be induced by exposure to external harsh environments (UV, sun burns, tanning). Although some of them, in particular cancers, can be treated by surgical excision, the patient condition can alter the decision to perform surgery or not. Topical drug treatment can therefore offer a relevant alternative, and many of these clinical issues have shown positive responses to treatment using thermal therapy combined with other treatments such as targeted drugs or radiotherapy. However, existing topical therapies frequently induce severe adverse effects. This proposal aims to develop an alternative solution based on nanostructured materials. These systems should come with enhanced capacity in terms of controlled thermal and mechanical properties useful for curing pathologies where localized heating and drug administration is required, primarily for skin diseases. In this proposal, the intellectual motivation is to develop an approach for efficiently fabricating materials with multifunctionalities that can be controlled or triggered on demand. The technological motivation is to design material-based engineered systems with selected functionality to act efficiently against specific diseases. We will focus on skin diseases typically induced by prolonged exposure to harsh external environments. The judicious selection of materials composing the proposed device can lead to controlling its temperature and mechanical properties. These aspects could be utilized as local and targeted treatment in numerous skin diseases