The Himalayan mountain belt was created as a result of collision of two continents: India with Eurasia. Around 120 Ma ago India was still a part of larger continent Gondwana and was located on the southern hemisphere near todays southern Africa and Madagaskar. Later it started its northward drift towards stable Eurasia. As a result, about 55-50 Ma ago the two continents collided. This has only slowed down the movement of the Indian continent which continues to move northwards until today. Over about 50 Ma, due to continuous push of India, Eurasia continues to be deformed. An expression of this process is the creation of the Himalaya and Tibet. Many complex geological process were involved which can now be deciphered from the rocks found in the Himalayan region. However, rocks formed during early collision are often eroded away and unavailable for direct investigations. During erosion they are disintegrated and deposited in sedimentary basins. This allows an indirect insight into the early time of the formation of the mountain chain by investigating single minerals that resist complete destruction. Although they are detached from their original rock context, they are invaluable source of information on the Himalayan evolution through geochemical, geochronological and isotopic studies.

Himachal Pradesh region of the Himalaya in India is the location of well-preserved sedimentary sequences from early collisional times, still deposited in the marine environment, a relic of the former Tethys ocean once separating India from Eurasia, until present day continental sediments deposited in the foreland basin. The former basins are now represented by a series of strongly deformed nappes. Deciphering sources of the sediments at different time periods over the past 50 Ma may provide a wealth of information on the evolution of the Himalaya which is an archetype of the continent-continent collision.

In this study we propose applying a well-established methods of radiometric age estimates which will allow us to identify source regions of the sedimentary rocks in the Himachal Pradesh as well as establish thermal evolution of the deformed basins themselves. In situ U-Pb zircon dating conducted by laser ablation ICP-MS provides information on mineral formation in the parental rocks. Thanks to this we can conclude about former relief of the Himalaya, uplift and exhumation of the Himalayan and neighboring rocks. Apatite fission track analyses on the other hand provide information on the late evolution of once deeply buried rocks which provides additional insight into a late stage evolution of the orogen. Thanks to high sensitivity of the latter method to temperature changes (the isotopic clock is reset when rock reaches about 100 °C), which are caused by thickening of the sedimentary rocks or nappes staking we may also provide information on the evolution of the sedimentary basins and/or on the structural evolution of the foreland basin. We propose a comprehensive sampling of the area which includes sampling of the entire stratigraphic sequence as well as sampling of the same units along most of the exposed length. Such approach has not been yet applied and it aims at identification of major changes in the evolving structure of the orogen and at identifying potential variations in source areas that may vary along strike of the mountain belt.