A Tarim-South China-North India connection in the periphery of Rodinia: Constraints from provenance of middle Neoproterozoic sedimentary rocks in the Altyn Tagh orogen, southeastern Tarim

Qian Liu¹,²
¹International Research Fellow of Japan Society for the Promotion of Science (Postdoctoral Fellowships for Research in Japan (Standard))
²University of Tsukuba, Life and Environmental Sciences, Japan (niuniuli880330@geol.tsukuba.ac.jp)

Locating Tarim during assembly and breakup of Supercontinent Rodinia remains enigmatic, with different models advocating a Tarim-Australia linkage or a location between Australia and Laurentia at the heart of unified Rodinia. In this study, zircon U-Pb dating results first revealed middle Neoproterozoic sedimentary rocks in the Altyn Tagh orogen, southeastern Tarim. These sedimentary rocks were deposited between ca. 880 and 750 Ma in a rifting-related setting slightly prior to breakup of Rodinia at ca. 750 Ma. A compilation of Neoproterozoic geological records indicates that the Altyn Tagh orogen in southeastern Tarim underwent ca. 1.0-0.9 Ga collision and ca. 850-600 Ma rifting related to assembly and breakup of Rodinia, respectively. In order to place Tarim in Rodinia, available detrital zircon U-Pb ages and Hf isotopes from Meso- to Neoproterozoic sedimentary rocks in relevant Rodinia blocks are compiled. Comparable detrital zircon ages (at ca. 0.9, 1.3-1.1, and 1.7 Ga) and Hf isotopes indicate a close linkage among southeastern Tarim, Cathaysia, and North India, but rule out a North or West Australian affinity for Tarim. In addition, detrital zircons from northern Tarim exhibit a prominent age peak at ca. 830 Ma with minor spectra at ca. 1.9 and 2.5 Ga but lack Mesoproterozoic ages, which are comparable to those from northern and western Yangtze. Together with comparable geological responses to assembly and breakup of Rodinia, a new Tarim-South China-North India connection is inferred in the periphery of Rodinia.