

DSM Science & Technology Awards (SOUTH) 2009	
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In my PhD work I synthesized and explored chemically modified ribonucleic acids as tools to investigate the structural and functional behaviour of biologically important RNAs such as riboswitches. Riboswitches are recently discovered domains in messenger RNAs that attract a lot of interest because they display a completely new gene regulation mechanism and represent possible new drug targets. They directly bind small target molecules like essential vitamins and thereby affect gene's activity. Thus mRNAs that contain riboswitches are directly involved in regulating their own activity depending on the presence or absence of the target compound. By chemically synthesizing riboswitch sequences with site-specific fluorescent labels I was able to get insights into the complex folding and refolding process that occurs when a riboswitch binds to its target molecule. This detailed knowledge provides a good basis for the functional engineering of riboswitches as well as for their further exploration as potentials drug targets.