Catalytic RNAs (ribozymes) emerging from a pool of random sequence RNA (blue) in response to in vitro selective pressure for catalytic activity. After an initial increase in abundance to detectable levels (green), with mutation and continued selection some improved catalysts come to dominate the population (red). Such in vitro manipulation can result in a population of new ribozymes with desired specificity. See page 1411 and the Perspective on page 1402. [Image: David Bartel, source; Tracy Keaton, additional illustration]