

# **Metal chelate affinity precipitation of RNA and purification of plasmid DNA.**

Balan S, Murphy J, Galaev I, Kumar A, Fox GE, Mattiasson B, Willson RC.

Department of Biology and Biochemistry, University of Houston, 4800 Calhoun, Houston, TX 77204-5001, USA.

The affinity of metal chelates for amino acids, such as histidine, is widely used in purifying proteins, most notably through six-histidine 'tails'. We have found that metal affinity interactions can also be applied to separation of single-stranded nucleic acids through interactions involving exposed purines. Here we describe a metal affinity precipitation method to resolve RNA from linear and plasmid DNA. A copper-charged copolymer of N-isopropyl acrylamide (NIPAM) and vinyl imidazole (VI) is used to purify plasmid from an alkaline lysate of *E. coli*. The NIPAM units confer reversible solubility on the copolymer while the imidazole chelates metal ions in a manner accessible to interaction with soluble ligands. RNA was separated from the plasmid by precipitation along with the polymer in the presence of 800 mM NaCl. Bound RNA could be recovered by elution with imidazole and separated from copolymer by a second precipitation step. RNA binding showed a strong dependence on temperature and on the type of buffer used.

PMID: 12889823 [PubMed - indexed for MEDLINE]