# Do nucleic acids moonlight as molecular chaperones?

Docter BE et al.

Nucleic Acids Research. 2016 06 02; 44(10):4835-4845

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## Classifications

Interesting Hypothesis New Finding

## Evaluations

**Exceptional** ★ ★ ★ 21 Oct 2016

Dan Bolon

The paper by Docter, Bardwell and colleagues provides evidence that nucleic acids, including double- and single-stranded DNA and RNA, have powerful chaperone-like activity towards proteins, including citrate synthase and luciferase, that are not known to bind to nucleic acids. There appears to be substrate specificity as the solubility and folding of other proteins, including rhodanese, lactalbumin and malate dehydrogenase, were not improved by nucleic acids. This observation opens many intriguing possibilities, including that nucleic acids may have facilitated the early development of proteins not only by encoding them but also by helping them to remain soluble and functional.

### Classifications

Interesting Hypothesis New Finding

**Cite this Recommendation:**

Bolon D: Faculty Opinions Recommendation of [Docter BE et al., Nucleic Acids Res 2016 44(10:4835-4845)]. In Faculty Opinions, 21 Oct 2016;

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**Very Good** ★ ★ 16 Jan 2017

Robert Poole

It is well known that molecular chaperones deal with the problem of unfolded proteins in cells using chaperones, which bind to these proteins and prevent aggregation. Most chaperones are themselves proteins but certain nucleic acids, polyphosphates and polycations can also act. Here, Docter, Bardwell and others show that DNA and RNA have potent chaperone activity in vitro. Indeed, they suppress the aggregation of classical chaperone substrates 300-fold more effectively than GroEL.

### Classifications

New Finding

**Recommended** 27.8

**Score 27.8**

❝ Relative citation ratio: **1.54**

★ Weighted sum of stars: **6.0**

↑ **Top 0.2%** in Structural Biology

**2 Recommendations**

1 ★★★ Exceptional

1 ★★ Very good

0 ★ Good

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