

# **Synthesis and Characterization of Poly-8-Methylamino-Adenylic.**

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## **Abstract:**

A polynucleotide, poly-8-methylamino adenylic acid, was synthesized and hybridized with poly U.

Adenosine-5-monophosphate purchased from BDN Chemical Corporation was brominated with bromine in Na-acetate buffer pH 3.9, stirred for 24 hours. The excess bromine was removed with some drops of concentrated sodium sulphite solution. It was then evaporated to dryness, on a rotatory evaporator at 37 °C and characterised. The product 8-Bromo-adenosine-5-Monphosphate, was methylaminated with methylamine in water, and refluxed for 48 hours at 65°C on an oil bath. Excess methylamine was removed with dilute sulphuric acid, while the product was evaporated to dryness and characterized.

The synthesized methylamino adenosine-5-monophosphate was converted to its diphosphate analogue by the phospho-morpholidate process. Orthophosphoric acid was used to introduce the phosphate group. The converted methylamino-adenosine-5-diphosphate was polymerized with the enzyme polynucleotide phosphorylase PNPase, (EC 2.7.7.8) from *Micrococcus luteus* that was purchased from Boehringer Chemical Corporation. This enzyme PNPase is only specific for the diphosphate form. The polymerization was carried out in a reaction medium of MgCl<sub>2</sub>.6H<sub>2</sub>O EDTA (Ethylene diaminetetra-acetic acid) and tris buffer pH 9.0. It was incubated for 21 hours at 36°C, and characterized.

The Poly-8-methylamino adenylic acid so synthesized was hybridized with poly U purchased from BDH- Chemical Corporation. The Job's continuous variation method in KH<sub>2</sub>PO<sub>4</sub> + K<sub>2</sub>HPO<sub>4</sub> buffer pH 7.00 at 37°C was adopted. The polymer formed at 1:1 hybrid with Poly U. This satisfies some of the requirements for synthetic polynucleotide inducers.

Some physico-chemical methods used in the characterization, included infra-red, ultra-violet, proton nuclear magnetic resonance and chromatographic methods.

Complete UV spectra were recorded in the range of 200-400nm on Sp 8-400 (uv/vis) spectrophotometer. The infra-red spectra recorded using a sodium chloride cell in the range of 200-4000 cm<sup>-1</sup> on Sp 3 -300 infra-red spectrophotometer. And, the Proton Nuclear Magnetic Resonance was recorded on Perkin Elmer Spectrophotometer. The spots on the paper chromatography were detected and developed under UV light (at 254 nm wavelength).

**Keywords:** Polynucleotide/ poly U/ bromine/ evaporation/ polymerization/ enzyme PNPase/ chromatography/ spectrometer

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