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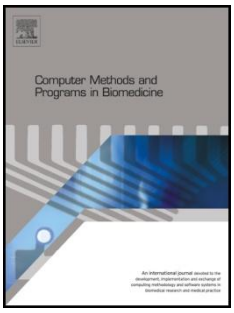

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Bio-mathematical analysis for the peristaltic flow of single wall carbon nanotubes under the impact of variable viscosity and wall properties

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Highlights

- Exact solution is calculated for the temperature and for the velocity profile.
- Temperature profile decreases when we add nanoparticles in our base fluid basically, higher thermal conductivity of the nano particle plays a key role for the quick dissipation this justifies that the use of single wall carbon nanotube in different type as coolant
- Increase in stiffness and Grashof number in the channel contributes to decrease in fluid velocity.
- Symmetry of the curved channel destroys due to the curvedness for velocity, temperature and for contour plots.
- Size of the trapped bolus smaller for pure blood case as compared to the SWCNTs.

Abstract:

Objective: The main objective of this paper is to study the Bio-mathematical analysis for the peristaltic flow of single wall carbon nanotubes under the impact of variable viscosity and wall properties.

Design/ approach: The right and the left walls of the curved channel possess sinusoidal wave that are travelling along the outer boundary. The features of the peristaltic motion are determined by using long wavelength and low Reynolds number approximation. Exact solutions are determined for the axial velocity and for the temperature profile.

Findings: Graphical results have been presented for velocity profile, temperature and stream function for various physical parameters of interest. Symmetry of the curved channel is disturbed for smaller values of the curvature parameter. It is found that the altitude of the velocity profile increases for larger values of variable viscosity parameter for both the cases (pure blood as well as single wall carbon nanotubes). It is detected that velocity profile increases with increasing

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