

## عنوان مقاله:

Airflow and Aerosol-Drug Delivery in a CT Scan based Human Respiratory Tract with Tumor using CFD

## محل انتشار:

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## خلاصه مقاله:

This paper is focused on to study the effect of a tumor present in the respiratory tract (in trachea) on airflow pattern and aerosol-drug deposition. A realistic model of human respiratory tract was constructed from spiral computed tomography (CT) scan data and a bifocal tumor (Glomus tumor) was constructed in the tract. The inspiratory flow characteristics of the realistic human airway models (with and without tumor) was numerically solved using the realizable k turbulence model for airflow and Shear Stress Transport (SST) k- $\omega$  turbulence model for two-phase flow. The velocity (contours and vector plots), wall shear stress and deposition efficiency of aerosol were obtained at different locations to the upstream and downstream region of the bifocal tumor in respiratory tract. The flow pattern shows that the maximum flow disturbance occurs around the tumor and at downstream of the flow. Magnitude and location of maximum wall shear stress in the presence of the tumor helps in identifying the extent and probable location of the wall injury during the normal and heavy breathing conditions. Deposition efficiency of aerosol-drug on .tumor location will be useful for designing the efficient targeted drug delivery system

## کلمات کلیدی:

Human respiratory tract, Glomus tumor, drug delivery, wall shear stress, Computational fluid dynamics (CFD), Aerosol

## لینک ثابت مقاله در پایگاه سیویلیکا:

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