RayBiology Ready for ASTRO 2002

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Together with software engineers from Philips Radiation Oncology Systems our development department have spent days and nights to put the final touch to the integration of RayBiology into the Pinnacle3 treatment planning system.

The module RayBiology adds the power of radiobiological objective functions and constraints to radiation therapy optimization and will (when officially released) be available as an add on module in the P3IMRT package from Philips.

The first version will contain the following biological objective functions:

- TCP (Tumor Control Probability)
- P+ (the probability to achieve complication free tumor cure),
- NTCP (Normal Tissue Complication Probability), and
- EUD.

A very useful and unique feature is that a biological objective function can be combined with any number of physical constraints. For instance, P+ can be maximized subject to a dose uniformity constraint for the target volume. It is also possible to combine a physical objective function with biological constraints, e.g. a desired dose distribution can be defined in terms of the physical objectives such as 'Min Dose', 'Max DVH' etc., and be combined with a constraint on the maximum NTCP allowed for a particular organ at risk.

The objective function must be either biological or physical while the list of constraints can contain any number of both biological and physical constraints. In other words, adding RayBiology to RayOptimizer greatly extends the toolbox for accurately capturing the clinical treatment objectives.