

Measurement of changes in tumor sizes (RECIST)

OsiriX Foundation

September 7, 2009

1 General Conditions

Please refer to <http://www.osirixfoundation.com/awards.html> for General Conditions.

2 Category

This document describes a **Category 2** Plugin Award Project.

3 Description

Tumor analysis often require size measurements for more objective assessment of changes over time, and response to treatments. Several techniques are being used clinically and require tedious manual measurements of individual tumor lesions and metastases over multiple studies performed over time. Not only the user must identify the lesions but he must often repeat the measurements to ensure that they are performed in a consistent way at similar locations between the different studies. Several standard techniques for measuring tumor sizes have been proposed in the literature to ensure consistent evaluation and to be applicable in multi-centric trials where patient data are analyzed by different users across different institutions.

RECIST (Response Evaluation Criteria In Solid Tumors) is a set of published rules that define when cancer patients improve ("respond"), stay the same ("stable") or worsen ("progression") during treatment. RECIST 1.1, published in January 2009, is an update to the original criteria. Today, the majority of clinical trials evaluating cancer treatments for objective response in solid tumors are using RECIST (<http://www.recist.com/index.html>). While the RECIST algorithm is based of measurement of tumor diameter it may be subject to a high variability in measurements. Several authors have advocated that the global volume of the tumor should be considered (http://health.siemens.com/ct_applications/customer_magazine/somatom_sessions/issue_20/download/02_02News.pdf). Therefore most clinical trials today will rely on both: diameter dimensions and global volume of the tumor.

4 Requirements

The goal of this plug-in is to provide a simple tool that allows users to outline either manually or automatically (using 3D segmentation tools already available in OsiriX, or new ones developed for specific types of lesions) tumor lesions that are identifiable on CT or MRI or even PET-CT studies. The program should then allow:

- Automatic measurement of tumor volume and standard measurements (maximum diameter in the 3 orthogonal planes as well as the maximum diameter measurable).
- Generate ROIs of these measurements
- Export these data in a file (XML) that can be easily exported to other databases for comparisons
- Allow automatic comparison of the changes of the tumor sizes by unique identification of each lesion across different studies performed on a given patient at different points in time

5 Deliverable

1. A fully functional plug-in that automatically perform the measurement task described above
2. Unique identification of tumor lesions across different studies and storage of follow-up measurements
3. Display the results in a synthetic result window that can be exported in PDF or in DICOM format

6 Contact

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