Title of project:

"Multi-Scale Portals to Toxicity" –
the Integration of 'Digital Image Metrics' and Structured Vocabularies
into a '3d metric' Software System of On-Screen Measuring

SUMMARY OF PROPOSED RESEARCH INCLUDING KEY GOALS

For scientifically qualified assessors:

To quantify toxicity, 3D Metrics will combine its unique software that visualizes complex data sets and analyses images from any microscope. This combination of data and images will be structured via vocabularies that control the terminology for this innovative and generic approach.

Images will be used for deriving new values that allow for correlations to measurements. Once data and images can be associated with the right vocabulary for the right scale, threshold limits and boundary values can be investigated and made accessible via data bases. This will allow for sorting, ranking, comparing and selecting data and images by choosing terms from vocabularies.

While 3D Metrics ensures the unique functionality of a web-based software system, Prof. Vadgama of Queen Mary's University, the Institute of Nanotechnology and SORIS will guarantee the right types of data and images so that, eventually, toxicity can be investigated on-line.

Collaboration with key organisations will ensure that "multi-scale portals to toxicity" will be programmed with appropriate menu options, drop down lists and user controls – by applying 3D Metrics' multi-scaling algorithm to quantifying toxicity in a variety of contexts, on different scales.

The conceptual key is the integration of programming, data and image analysis as the foundation for innovative on-screen measuring.

For lay readers:

As generic innovation, 3D Metrics' software attributes values to digital images and other complex data sets as 'numerical metadata'. This means images can be classified into collections, and their contents can be recognized from numerical comparisons.

Milestone 1 means collecting toxicity related measurements and images and establishing data bases of 'numerical metadata'.

To attribute meaning to these values, milestone 2 means defining vocabularies that describe what images portray. Further vocabularies will contain conventional metrological terms and novel terms for the values attributed to images.

Milestone 3 will then investigate all aspects of toxicity encountered in as many images as were supplied by strategically selected collaborators.

The software will be offered on the web by subscription, and special care will be taken to visualize the newly found values in the most accessible ways for new insights and interpretation. For even the lay patient should be able to ascertain how the picture of a mole is changing over time or cells change under the influence of drugs.

This new and enabling technology will allow for investigating drugs, natural and synthetic substances, materials and the monitoring of health related processes.