

## Mutagenesis as a biomarker of risk areas for carcinogens: Human biomonitoring

Vargas V M F<sup>1,2</sup>, Coronas M V<sup>1,2</sup>, Pereira T S<sup>1,2</sup>, Rocha J V<sup>1</sup>, Rodrigues ML<sup>1</sup>, Fachel J<sup>3</sup>, Faccini L S<sup>4</sup>, Thiesen F<sup>5</sup>, Nussbaumer L<sup>6</sup>, Oliveira S<sup>6</sup>  
Dapper V<sup>6</sup> and Salvadori D M F<sup>7</sup>

<sup>1</sup>Fundação Estadual de Proteção Ambiental, FEPAM. Avenida Salvador França, Brazil.

<sup>2</sup>Curso pós-graduação Ecologia, UFRGS.

<sup>3</sup>Instituto Matemática e Estatística, UFRGS.

<sup>4</sup>Depto Genética, UFRGS.

<sup>5</sup>Instituto de Toxicologia, PUCRS.

<sup>6</sup>Secretaria Saúde RS,

<sup>7</sup>Depto Patologia, UNESP, SP.

Chemical dispersions of hazardous waste in the environment form complex mixtures containing toxic, genotoxic and carcinogenic agents. Dispersion modifies ecosystems distant from the sources exposing the population to greater risks. Epidemiological studies have associated health problems, especially cancer, acute or chronic cardiorespiratory diseases exposed to genotoxins. FEPAM/RS has implemented strategies to assess environmental genotoxins using biomarkers as early parameters to prevent contamination risks. Studies looked at exposure routes physically characterizing areas, definition and dispersion of contaminants in environmental compartments and early toxic or genotoxic biomarkers. *Salmonella*/microsome assay responses were markers assessing atmospheric compounds associated with wind distributions indicating chronic exposure. Comet assays in peripheral blood lymphocytes and micronuclei of oral mucosa cells were genetic markers for biomonitoring urban populations exposed to different industrial activities at an oil refinery (Site 02), industrial complex (Site 03), site with contaminated soil (Site 04) and reference (Site 01 far from main industrial districts, with restricted urban traffic). PAH, nitro-PAHs, aromatic amines, pentachlorophenol, dioxins/furanes and heavy metals were the main stressors. At Site 04 a significant incidence of neoplasms was identified, especially in first degree relatives. The Comet assay in peripheral blood lymphocytes and micronuclei of oral mucosa cells was sensitive to exposure to human environmental mutagenic compounds. Mutagenesis quantification per unit of sample in different compartments allowed comparing results in different areas. Diagnostic strategies allow selecting genetic damage biomarkers as early indicators for assessing environmental release of hazardous wastes in ecosystems and for preventing risk effects on life quality of the general population. EcoRISCO-SAÚDE/INAGEMP/CNPq/CAPES/FAPERGS.

### Biography

Vera Maria Ferrão Vargas completed her Ph.D in 1992 at Universidade Federal do Rio Grande do Sul (UFRGS), Brazil. She is the coordinator of the Research Program at FEPAM, the Rio Grande do Sul state environmental protection agency, a Professor in the Graduate Program of Ecology at UFRGS and Specialization Course of Toxicology at the Pontificia Universidade Católica do Rio Grande do Sul (PUCRS), a research fellow in the National Council of Science and Technology(CNPq) and vice-president of the Latin American Mutagen Society. She has published over 40 papers in refereed journals.