

# Novel Biomarker for Diagnosis and Prognosis of Mesothelioma

(FCCC Ref. 546-JT)

## Background

Presently, malignant mesothelioma causes about 3,000 deaths per year in the United States, and about 5,000 in Western Europe. Most cases of pleural mesothelioma have been linked to high levels of asbestos exposure, usually in the workplace. With increased urban development, exposure may also occur from disturbing asbestos and erionite-containing soil. Despite asbestos abatement efforts, malignant mesothelioma rates have remained stable in the US since 1994 and are expected to increase by 5-10% per year in most European countries for the next 25 years. In developing countries, where use of asbestos is increasing with sometimes inadequate safeguards, a dramatic rise in malignant mesothelioma incidence is predicted as well. With exposure to mineral fibers such as asbestos continuing, it is important to identify risk factors that may predispose individuals to develop malignant mesothelioma. A knowledge of such risk factors may provide for interventions that may delay or prevent the onset of this deadly disease.

## Summary of the Invention

Renown scientists from Fox Chase Cancer Center discovered that germline mutations in the *LRRK2* gene can identify individuals at high-risk of mesothelioma. Relatives of individuals who are carriers of a mutant *LRRK2* gene may also be tested. *LRRK2* gene is suggested to be included in prognostic/diagnostic blood NGS panels for mesothelioma (companies and hospitals). In addition, it was found that loss of LRRK2 protein expression occurs frequently in mesothelioma generally. Since LRRK2 loss of protein expression has been associated with homologous DNA repair deficiency and inflammation/immunosuppression, loss of LRRK2 expression may serve as a biomarker of response of mesothelioma patients to immunotherapy either alone or in combination with a PARP inhibitor.

Reference: Cheung M., et al., *Hum Mol Genet* **30**:1750-1761, 2021. <https://doi.org/10.1093/hmg/ddab138>

## Advantages

- New biomarker for mesothelioma.
- Can guide most adequate therapy of mesothelioma.

## IP Status

Patent application has been filed.

## For Partnering/Licensing information, please contact:

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