Background: Laboratory workers are exposed to a number of carcinogenic substances, and, thus, may be at risk for developing cancers. Laboratory workers in Hadassah Hospital are also exposed to various occupational carcinogens, such as formaldehyde, benzene, other solvents, ionizing radiation, and others. The workers have become concerned about an increased risk of cancer in their group. The perceived cancer cluster was reported recently and therefore investigation is required.

General objective: To determine whether there is an excess risk of cancer among laboratory workers at Hadassah Hospital in comparison with two groups – nurses and administrative workers, and with the general Israeli population. Methods: The study design is a historical cohort study. The study population included laboratory workers, nurses and administrative workers of Hadassah Hospital who had been employed at least one year between 1st January 1986 and 31st December 2009. The cohorts were identified and reconstructed from the Occupational Health Unit using datasets of the Human Resources and Payroll Departments of the Hadassah Hospital. The cohort was then followed for a cancer event, death or end of employment until 31st December 2009. Linkage with the Israeli Cancer Registry was performed using unique identity numbers. Comparison of the incidence rates was done using Person-Time Incidence analysis and Standardized Incidence Ratios. Cox proportional hazard analysis was used to adjust for potential confounders. Person-Time Incidence was also calculated for 10 and 15-years incubation periods.

Results: The cohort consisted of 1023 laboratory workers, 2270 nurses, and 913 administrative workers. The percentage of women ranged from 64% to 87%, and more than 85% of the workers were Jewish. We observed 314 cancers, of which
119 were female breast cancer cases. We found that male laboratory workers were at decreased risk compared to administrative workers (rate ratio=0.32, 90% C.I.=0.15-0.71). Female laboratory workers were at similar risk compared to both nurses and administrative workers. We observed an increased risk of breast cancer among female laboratory staff relative to nurses (rate ratio=1.57, 90% C.I.=1.03-2.40) allowing for 10- year incubation period as well as a significant excess in risk of breast cancer (SIR=1.46, 90% C.I.=1.04-1.88) among female laboratory workers relative to Israeli females. Female laboratory personnel had an excess risk of malignant melanoma compared to nurses (rate ratio=3.93, 90% C.I.=1.58-9.76) and Israeli females (7 observed cases vs. 2.96 expected, SIR=2.36, 90% C.I.=0.89-3.84), yet there was no risk in comparison with the administrative workers (rate ratio=1.08, 90% C.I.=0.48-2.43).

**Conclusion**: We suggest that work in the laboratories of the Hadassah Hospital, while not associated with increased risks among males, might involve an increased risk of breast cancer and malignant melanoma among female personnel. This increase, if confirmed, may not be related to occupational exposures but rather to behavioral and sociodemographic characteristics in this population. To further address this concern we recommend to continue the follow-up of the workers and to conduct a nested case-control study investigating individual characteristics and habits.