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CANCER PREVALENCE IN SUBJECTS EXPOSED TO  
ALKYLATED SUBSTANCES (PFAS)

James Dahlgren MD<sup>1</sup>, Ayman B Ibrahim MD<sup>1,2,3</sup>, Ray Warshaw<sup>2</sup>, Harpreet Takhar  
MPH<sup>3</sup>

1. UCLA School of Medicine. 2. Comprehensive Health Screening Services.
3. Dahlgren Medical Group

Please address correspondence to:

James Dahlgren, MD

2811 Wilshire Blvd.

Santa Monica, CA 90403

Voice: 310-449-5525 ext. 226

FAX: 310-449-5526

[dahlgren@envirototoxicology.com](mailto:dahlgren@envirototoxicology.com)

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Perfluorinated alkane substances (PFAS) are man-made chemicals that include Perfluorooctanoic Acid (PFOA) and perfluorooctanoate sulfonate (PFOS). PFOA is also referred to as C8. PFOA is a key ingredient agent in the production of Teflon® and other fluorochemicals and is biopersistent and bioaccumulates. There has been documented chronic exposure to PFOA of the residents near a plant using C8 and other fluorinated contaminants.

Our aim was to compare cancer distribution and cancer prevalence rates in a PFOA-exposed population (residents) to that of the industry cancer registry data from an occupational exposed population and finally to the general population (SEER). We performed a questionnaire on 594 residents living near a PFOA facility. Cancer registry data from the C8 occupational workers was obtained via the freedom of information act. The SEER data was used for comparison to the general population.

The overall cancer prevalence rate is higher in the PFOA-exposed population when compared to the general population. Resident cancer prevalence rates after standardization to the general U.S. population is shown in Table 1. The residents from age 24-65 have a significantly higher rate of prevalence cancer when compared to the general population (data not shown).

Our findings indicate that the exposed population (residents) have similar cancer prevalence findings to the PFOA exposed workers (Table 1). Prostate cancer in the workers was proportionately elevated among young age males.

The distribution of cancers in the residents and workers is different than expected. Of note are the findings of elevated prevalence rates of atypical cancers such as Hodgkin's, Leukemia, and Multiple Myeloma.

This data suggests that exposure to PFOA and PFOS may alter cancer distribution in exposed populations (worker and residents) and may be an important risk factor for an excess of cancer cases.

Table 1. Total Prevalence Rates in Dupont Study, Resident Population, and US Population

| Type of Cancer | Dupont Study |            |       | Resident Data |            |        | U.S. Data |            |       | Dupont: US |  | Resident: US |  |
|----------------|--------------|------------|-------|---------------|------------|--------|-----------|------------|-------|------------|--|--------------|--|
|                | Cancers      | Population | Rate  | Cancers       | Population | Rate   | Cancers   | Population | Rate  | Ratio      |  | Ratio        |  |
| Bladder        | 10           | 5523       | 0.33% | 5             | 576        | 0.87%  | 449740    | 281421906  | 0.16% | 2.04       |  | 5.43         |  |
| Bone           | 2            | 5523       | 0.04% |               |            |        | 25417     | 281421906  | 0.01% | 4.01       |  |              |  |
| Brain          | 6            | 5523       | 0.11% |               |            |        | 83551     | 281421906  | 0.03% | 3.66       |  |              |  |
| Breast         | 5            | 1034       | 0.48% | 6             | 293        | 2.05%  | 1969304   | 143368343  | 1.37% | 0.35       |  | 1.49         |  |
| Cervix         |              |            |       | 7             | 293        | 2.39%  | 169992    | 143368343  | 0.12% |            |  | 20.15        |  |
| Colon & Rectum | 32           | 5523       | 0.58% | 5             | 580        | 0.86%  | 948677    | 281421906  | 0.34% | 1.72       |  | 2.56         |  |
| Esophagus      | 3            | 5523       | 0.05% |               |            |        | 20767     | 281421906  | 0.01% | 7.36       |  |              |  |
| Hodgkin's      | 4            | 5523       | 0.07% | 2             | 579        | 0.35%  | 115991    | 281421906  | 0.04% | 1.76       |  | 8.38         |  |
| Kidney         | 18           | 5523       | 0.33% | 2             | 580        | 0.34%  | 186771    | 281421906  | 0.07% | 4.91       |  | 5.20         |  |
| Larynx         | 6            | 5523       | 0.11% |               |            |        | 92802     | 281421906  | 0.03% | 3.29       |  |              |  |
| Oral Cavity    | 11           | 5523       | 0.20% |               |            |        | 202193    | 281421906  | 0.07% | 2.77       |  |              |  |
| Leukemia       | 11           | 5523       | 0.20% | 1             | 580        | 0.17%  | 166338    | 281421906  | 0.06% | 3.37       |  | 2.92         |  |
| Liver          | 4            | 5523       | 0.07% |               |            |        | 13265     | 281421906  | 0.00% | 15.37      |  |              |  |
| Lung           | 64           | 5523       | 1.16% | 5             | 576        | 0.87%  | 328242    | 281421906  | 0.12% | 9.94       |  | 7.44         |  |
| Melanoma       | 17           | 5523       | 0.31% | 5             | 576        | 0.87%  | 512355    | 281421906  | 0.18% | 1.69       |  | 4.77         |  |
| Myeloma        | 9            | 5523       | 0.16% | 2             | 579        | 0.35%  | 46867     | 281421906  | 0.02% | 9.70       |  | 20.74        |  |
| Non Hodgkin's  | 9            | 5523       | 0.16% | 5             | 576        | 0.87%  | 301438    | 281421906  | 0.11% | 1.52       |  | 8.10         |  |
| Pancreas       | 9            | 5523       | 0.16% |               |            |        | 23135     | 281421906  | 0.01% | 19.82      |  |              |  |
| Prostate       | 19           | 4489       | 0.42% | 9             | 206        | 3.15%  | 1622199   | 138053563  | 1.18% | 0.36       |  | 2.68         |  |
| Testicular     | 5            | 4489       | 0.11% |               |            |        | 129614    | 138053563  | 0.09% | 1.19       |  |              |  |
| Thyroid        | 3            | 5523       | 0.05% | 1             | 580        | 0.17%  | 245167    | 281421906  | 0.09% | 0.62       |  | 1.98         |  |
| Uterus         | 1            | 1034       | 0.10% | 7             | 293        | 2.39%  | 464835    | 143368343  | 0.32% | 0.30       |  | 7.37         |  |
| TOTAL          | 304          | 5523       | 5.50% | 76            | 505        | 15.05% | 8722061   | 281421906  | 3.10% | 1.78       |  | 4.86         |  |