LITERATURE SEARCH RESULTS

FOR THE SYSTEMATIC REVIEW OF
TRANSGENERATIONAL INHERITANCE OF HEALTH EFFECTS

May 2017

Office of Health Assessment and Translation
Division of the National Toxicology Program
National Institute of Environmental Health Sciences
National Institutes of Health
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
LITERATURE SEARCH RESULTS

Literature Search

Search terms were developed by an informationist (SDH) familiar with systematic review methodology to identify all relevant published evidence indexed in the PubMed database (MEDLINE) that addressed the PECO statement for transgenerational inheritance of health effects potentially associated with a wide range of exposures. Since there are no MeSH terms for transgenerational effects or transgenerational inheritance, our search strategy was developed using text words that describe a transgenerational study and terms used to report the topic of transgenerational inheritance in the literature. The resulting strategy was used to search PubMed (specific search terms presented in Appendix 1). No language restrictions or publication year limits were imposed and PubMed was searched up to November 2016.

Database Searched

- PubMed

Literature Search Results

The Pubmed database search retrieved 63,789 references and 3 additional references were identified by experts or reviewing published reviews and reference lists from the included studies. Ninety-eight percent of the total references retrieved (62,671) were excluded during the title and abstract screening and 844 were excluded during the full text review for not satisfying the PECO criteria. After full text review, 282 studies were considered relevant; 49 human and 232 animal studies (Error! Reference source not found.).
Figure 1. Study Selection Diagram

References identified through other sources (n=4)

References identified through database searches (n=63,789)

References after duplicate removal Title-abstract screened for relevance and eligibility (n=63,754)

Full-text references assessed for relevance and eligibility (n=1,126)

Full-text references excluded
• Exposure not relevant (n=36)
• Review or commentary (n=286)
• Not Transgenerational design (n=437)
Foreign Language (n=85)

References excluded as not relevant to PECO criteria (n=62,671)

References included for data extraction (n=282)

Human studies (n=49)

Animal studies (n=232)
REFERENCES INCLUDED AFTER FULL-TEXT REVIEW

List of Included Studies

**Studies in humans**


Ben-Ezra M, Palgi Y, Soffer Y, Shira A. 2012. Mental health consequences of the 2011 fukushima nuclear disaster: Are the grandchildren of people living in hiroshima and nagasaki during the drop of the atomic bomb more vulnerable? World Psychiatry 11:133.


Kaplan, II. 1960. X-ray irradiation to the ovaries. Does it lead to development of or increase in the tendency to malignancy in children and grandchildren of irradiated married women? Acta Unio Int Contra Cancrum 16:431-434.


**Studies in non-human animals**


Fahmy MJ, Fahmy OG. 1982. Genetic activities of 4-chloromethylbiphenyl, the 4-hydroxy derivative and benzyl chloride in the soma and germ line of drosophila melanogaster. Mutat Res 100:339-344.


Steffensen IL. 2016. Obesity and intestinal tumorigenesis in adult min/+ mice from early-life high-fat diet exposure were not inherited transgenerationally. Anticancer research 36:3871-3882.


Appendix 1. Literature Search Strategy

There are no major subject heading terms for transgenerational effects or transgenerational inheritance. Therefore, the search strategy required development of a search strategy that addressed key terms associated with the various concepts of transgenerational inheritance such as “transgenerational”, “multigenerational” or “intergenerational” studies as well as terms to address successive generations. To capture all of the concepts, the full search strategy combined each of the numbered searches described below (#1-5). This evaluation is focused on the evidence of transgenerational inheritance and not the mechanism of action; therefore, we did not include mechanistic or mechanism of action terms in our search.

<table>
<thead>
<tr>
<th>Search number</th>
<th>Specific Search Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Transgeneration*[tiab] OR trans-generation*[tiab]</td>
</tr>
<tr>
<td>#2</td>
<td>multigeneration*[tiab] OR multi-generation*[tiab] OR intergeneration*[tiab] OR inter-generation*[tiab]</td>
</tr>
<tr>
<td>#3</td>
<td>(F2 OR &quot;F 2&quot; OR &quot;F(2)&quot; OR F3 OR &quot;F 3&quot; OR &quot;F(3)&quot; OR F4 OR &quot;F 4&quot; OR &quot;F(4)&quot; OR F5 OR &quot;F 5&quot; OR &quot;F(5)&quot; OR F6 OR &quot;F 6&quot; OR &quot;F(6)&quot; OR F7 OR &quot;F 7&quot; OR &quot;F(7)&quot; OR F8 OR &quot;F 8&quot; OR &quot;F(8)&quot; OR F9 OR &quot;F 9&quot; OR &quot;F(9)&quot; OR F10 OR &quot;F 10&quot; OR &quot;F(10)&quot;) AND (generation*[tiab] OR offspring*[tiab] OR progeny*[tiab])</td>
</tr>
</tbody>
</table>

Full search: Full search was the combination of each of the concepts listed above (#1 OR #2 OR #3 OR #4 OR #5)