

**Mini project:**

**Title:** Understanding pathways from early life adversity to inflammatory profile in mid-life: an illustrative project exploring specific early adversities and potential explanations from the life-course

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**Background:** Early life adversity (ELA) as indexed for example by low socio-economic position has been linked to inflammatory status later in life. Thus, inflammation is one of several potential processes (including epigenetic alterations, neuroendocrine processes (particularly of the HPA axis), neural structure and function) by which ELAs are thought to 'get under the skin' and become biologically embedded. Interestingly, the same key processes that may represent biological embedding of ELAs including inflammation, are also seen as key biological mechanisms, along with changing body composition, of later life functional decline and the emergence of frailty. Understanding the ELA link with later inflammation is therefore likely to be relevant to health and function later in life.

Yet we know little about whether: i) some early life adversities (ELAs) have stronger associations with adult inflammation status than others (which may provide clues on underlying mechanisms) and ii) explanations vary for different ELA- adult inflammation associations. For example, the child to adult BMI trajectory varied by type of childhood maltreatment in the 1958 cohort suggesting that associations with inflammatory outcomes might also vary, as adiposity increases the inflammatory response.

**Aims:** To provide an illustrative project for the 'Reversibility' network theme on specific ELAs and related pathways to adult outcome, we propose to undertake further analysis of the 1958 birth cohort to investigate the questions (i and ii) above.

**Outputs and other benefits to the Network:** Building on the rationale outlined above, the project:

- takes advantage of a rare data source with information on different ELAs, intervening pathways and adult biomarker data;
- leads to possible co-ordinated analyses of other data sets (e.g. MIDUS)
- produces work for relevant Network outputs (e.g. for next meetings, including possible symposium (DoHaD conference) and/or related publication)
- provides an opportunity to enrich the UK-US collaboration and capacity building

**How this project will contribute to the Network Agenda:** Proposed analyses will test hypotheses regarding biological pathways (specifically inflammation)

thought to link ELA to various adult health outcomes. Project will include examination of network questions regarding whether there are common or unique relationships for different types of ELAs with inflammation and health outcomes. Project is further designed to serve as illustrative example of the type of analyses working group members may pursue in order to develop a more comprehensive evidence base regarding unique vs common relationships between various ELA's and aspects of health in adulthood.