**Appendix: Lay Summary**

**Introduction: TAOK Proteins and Their Role in Developmental Disorders**

TAOK proteins are important for various functions in our body, such as communication between cells, organising cell structures, and brain development. Changes in the *TAOK1* gene, which alter the TAOK1 protein, are linked to a developmental disorder with unique facial features, low muscle tone, and feeding difficulties. Changes in the *TAOK2* gene, affecting the TAOK2 protein, are associated with autism and early obesity. Until now, there hasn’t been a clear description of a developmental disorder specifically related to *TAOK2* gene.

**Our Study**

We studied health and genetic information from individuals from several medical centres in different countries who have changes in the *TAOK1* or *TAOK2* genes. These changes were found using advanced genetic tests called exome and genome sequencing.

**Findings**

***TAOK1* Gene Changes**:

We studied 50 individuals with changes in the *TAOK1* gene (37 different *TAOK1* gene changes).

* **Common health problems**:
  + Developmental difficulties (such as delayed development, learning difficulties, autism, behavioural issues)
  + Larger head (83%)
  + Low muscle tone (58%)
* **Newly Reported health problems**:
  + Male genital abnormalities
  + Episodes of low blood sugar (hypoglycaemia)

**TAOK2 Gene Changes**:

We studied 10 individuals with changes in the *TAOK2* gene (nine different *TAOK2* gene changes).

* **Common health problems**:
  + Developmental difficulties (such as delayed development, learning difficulties, autism, behavioural issues)
  + Larger head (75%)
  + Autism (75%)
  + Overweight/obesity (70%)

**Key Discoveries**

* We report the largest group of individuals with *TAOK1*-related developmental disorder.
* We have identified 30 new changes in the *TAOK1* gene.
* We describe a new disorder related to *TAOK2* changes, characterised by developmental difficulties, autism, larger head, and obesity.
* **Similarities and Differences**:
  + Both *TAOK1* and *TAOK2* changes cause developmental difficulties.
  + Feeding difficulties and congenital abnormalities are more common with *TAOK1* changes.
  + Obesity is more common with *TAOK2* changes.