

**CREATION OF AN INTERACTIVE
GENE EXPRESSION ATLAS FOR
PRADER-WILLI SYNDROME
PATIENTS, FAMILIES, AND
RESEARCHERS**

Deborah J. Good

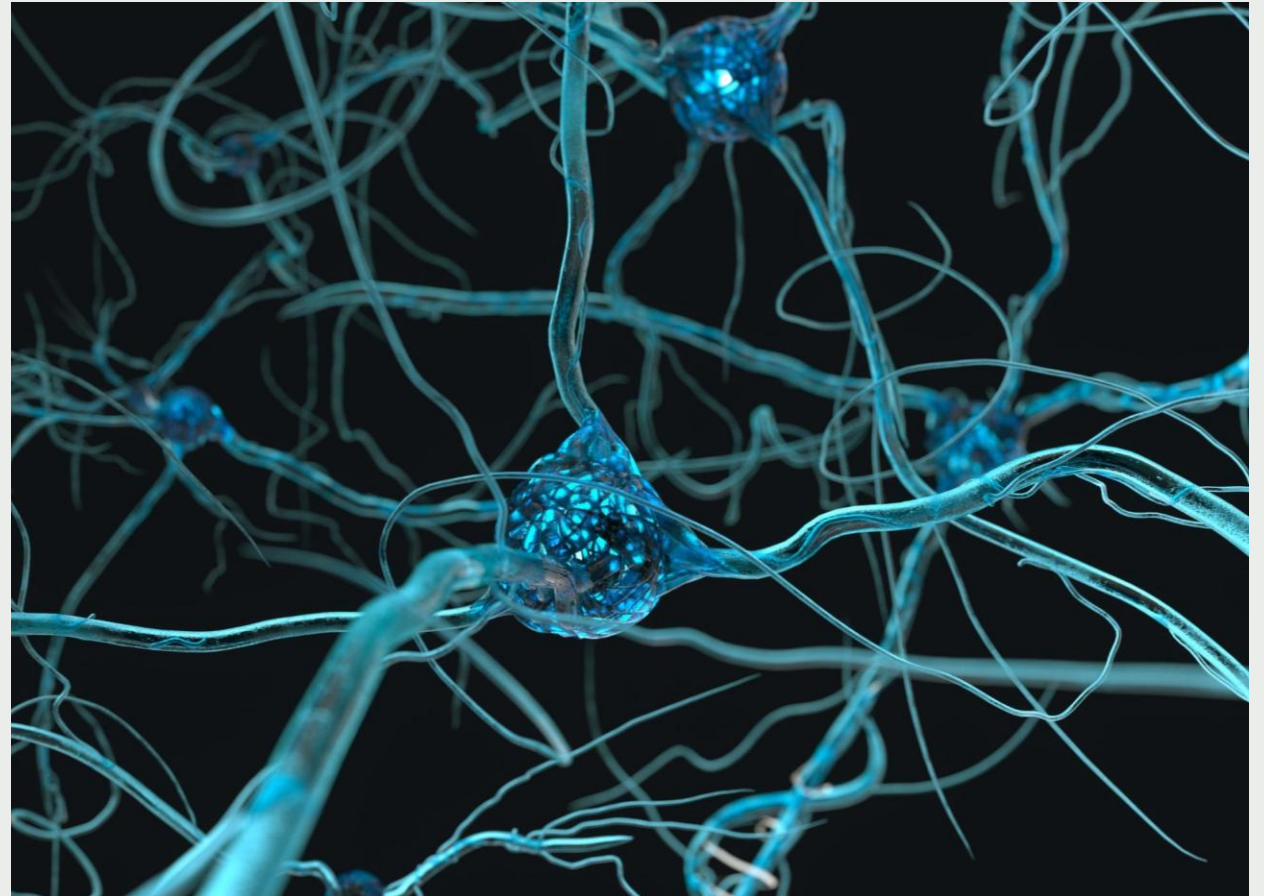
Jennifer Goyne

Shadi Ariyanfar

William "Lee" Hunter

Mira Yeoh

Savannah Coultrey



Symptoms in Prader-Willi Syndrome

Hyperphagia and
obesity

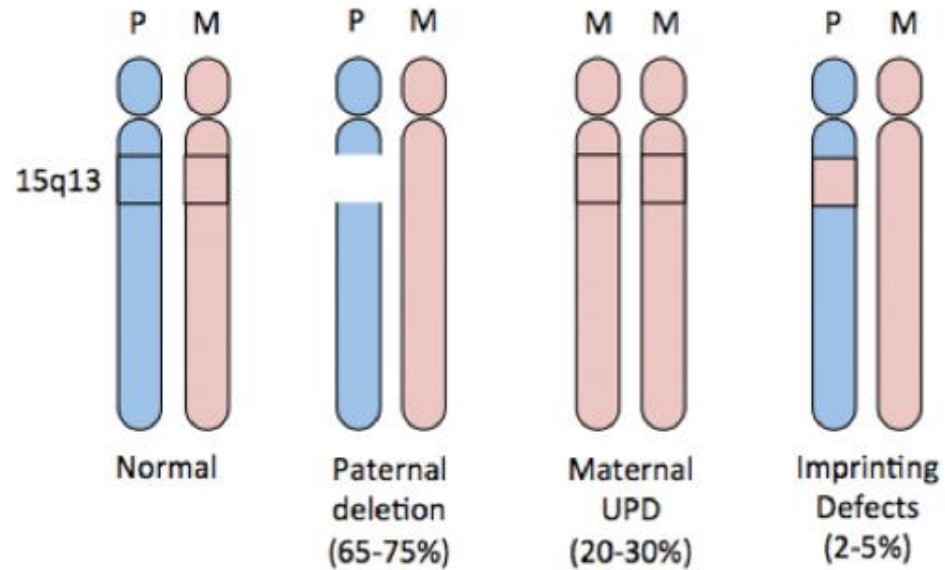
Hypogonadism and
delayed puberty

Social anxiety, temper
outbursts



CELEBRATE  **RARE**

Prader-Willi syndrome : Genetic mechanisms



<http://www.genetics4medics.com/prader-willi-syndrome.html>



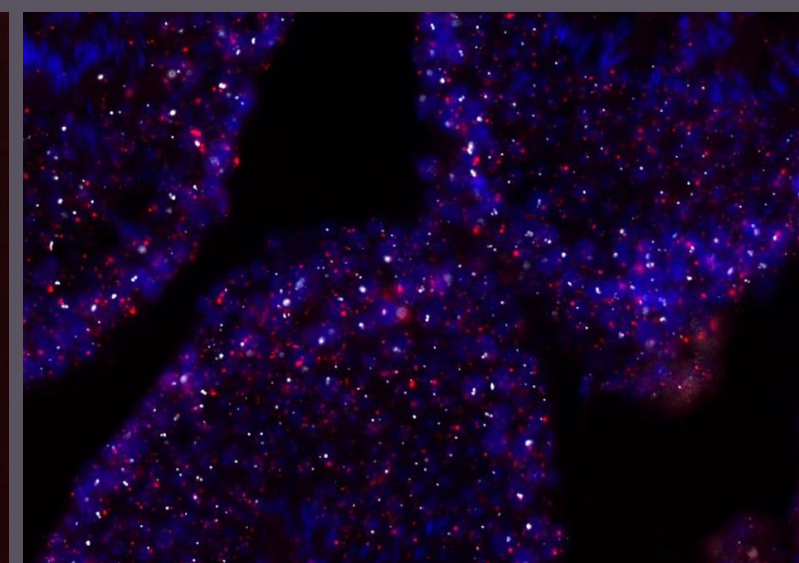
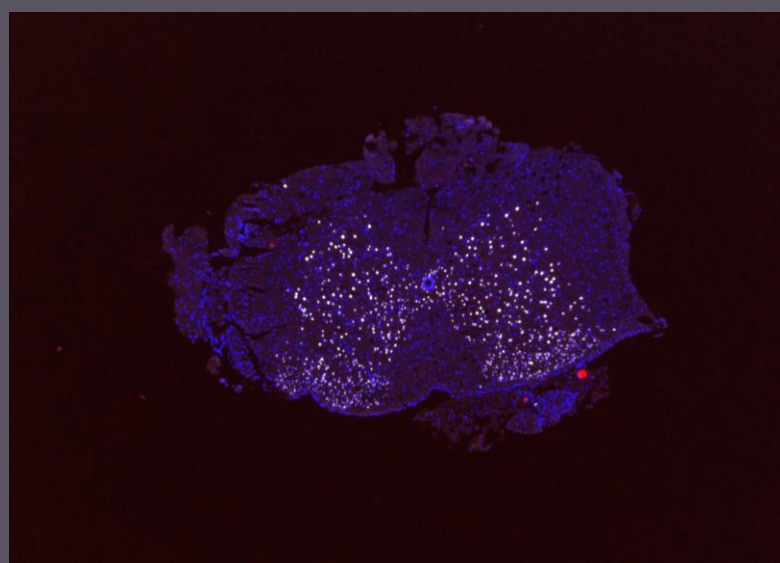
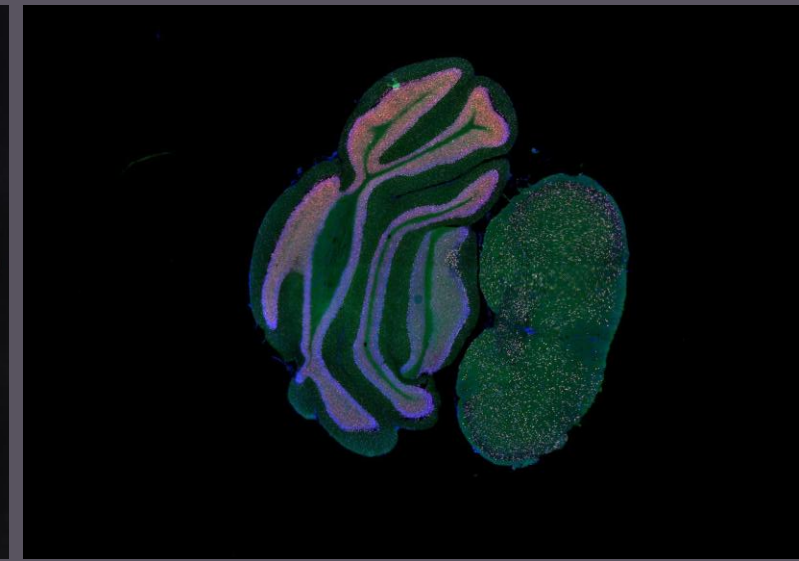
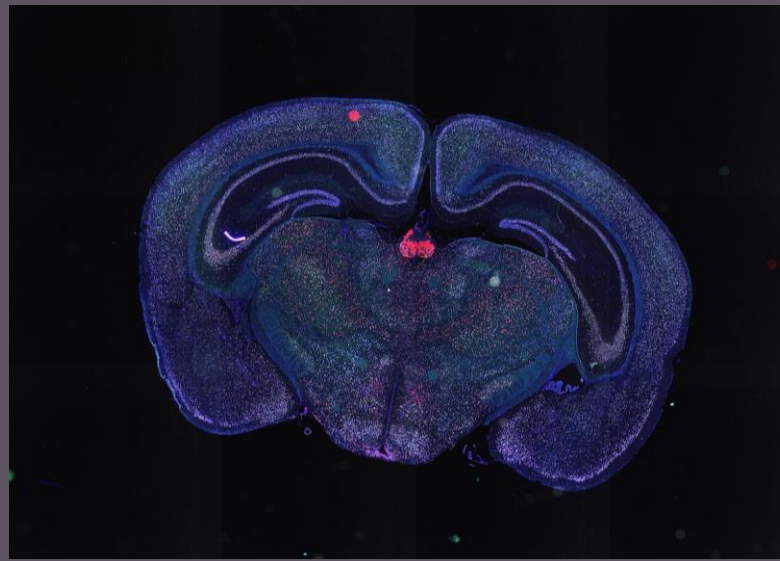
Loss of Snord116
non-coding RNA

Reduction of
Nhlh2 mRNA
expression



**Snord116 and Nhlh2
are expressed in the
brain**

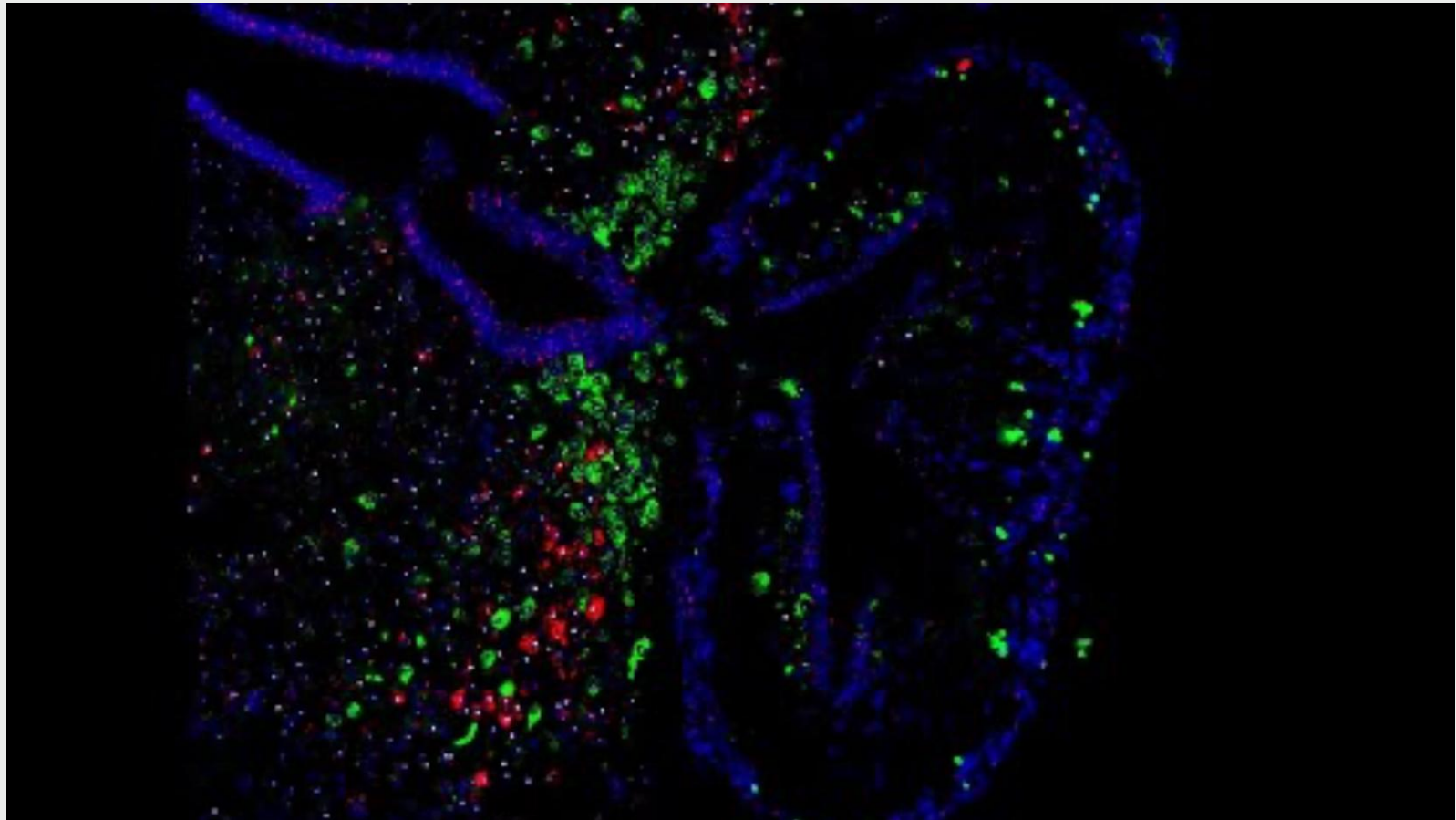
**As well as some
peripheral tissues such
as ovaries, testis, liver,
heart**



Methodology

- Images were created using **RNAScope Fluorescent In Situ Hybridization Technology** to label individual neurons with each RNA type.
- Pictures were captured using several different types of microscopy, and the pictures were exported as tiff files.
- **ImageJ software** was used to color-correct, resize, and crop the tiff files, which were then converted into an OME-tiff stack via the command-line tool bftools.
- Once this process was complete, the photos would then be imported into **Minerva**, where the correct channel colors and labels were applied for image readability.
- Stories to accompany the pictures were written, including both a general overview of the picture and a more scientific “deep dive” into the data.
- This process was cataloged so that future stories could be developed quickly and consistently.





Here is a [link](#) to an unlisted Youtube video



Visit the interactive atlas!

Co-expression of Nhlh2 mRNA and Snhg14 long non-coding RNA in wild type mouse brain tissue

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An interactive tour of the coronal section of an adult wild-type mouse brain, showing Nhlh2 mRNA and Snhg14 RNA localization in habenula neurons, using RNAscope in situ hybridization. RNAscope is known as a powerful method to detect gene expression within the spatial and morphological context of the tissue.

All images are acquired using a BioTek Cytation5 cell imaging multimode reader.

DAPI (blue stain), enables the visualization of nuclear DNA. Table of Contents

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1. Introduction
2. Coronal section of wild-type Habenula
3. Medial and lateral habenula expression pattern
4. Co-expression of Snhg14 and Nhlh2 in the single nucleus of habenula neurons

Channel Groups

- Channel 3 DAPI
- Channel 4 Snhg14
- Channel 5 Nhlh2

4x magnification of the coronal section of wild-type Habenula

20x magnification of the coronal section of wild-type Habenula MORE

60x magnification of the coronal section of wild-type habenula

THANK YOU!

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