

The protein families game: a learning tool for non-scientists



Typhaine Paysan-Lafosse¹, Alex Bateman¹

(1) EMBL-EBI, Wellcome Genome campus, Hinxton, Cambridge, CB10 1SD, United Kingdom

Introduction

Proteins with similar sequences are assumed to be homologous and usually have similar structures and functions.

Proteins can be classified into groups according to sequence or structural similarity.

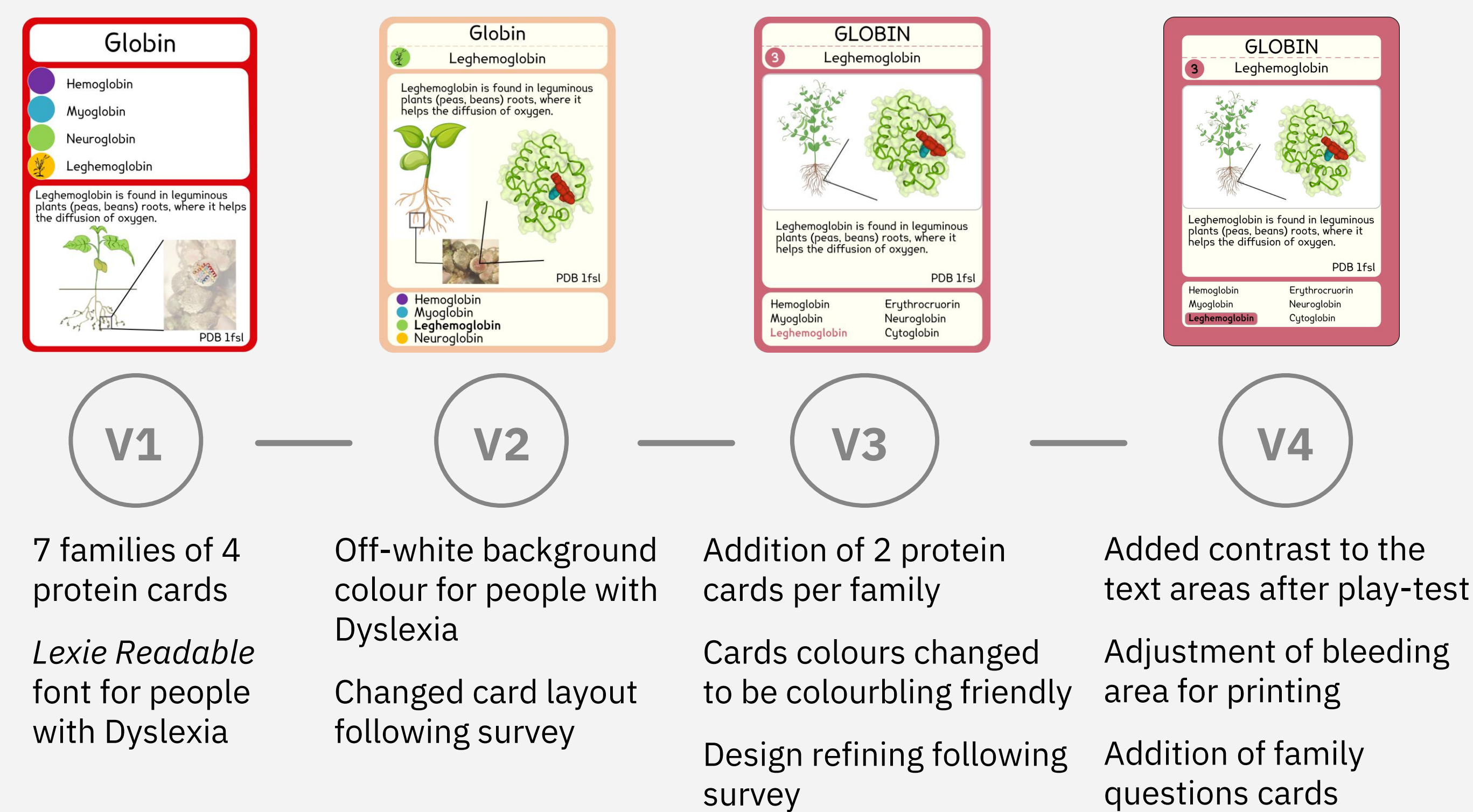
A protein family is a group of proteins that share a common evolutionary origin, reflected by their related functions and similarities in sequence or structure.

The Protein families game contains seven protein families, where each family is composed of six protein cards. The goal is to collect the maximum number of families by asking the other players for the protein cards you are missing in your hand to complete your families.

The game is available as a printed version as well as an online version in the Tabletopia game platform.

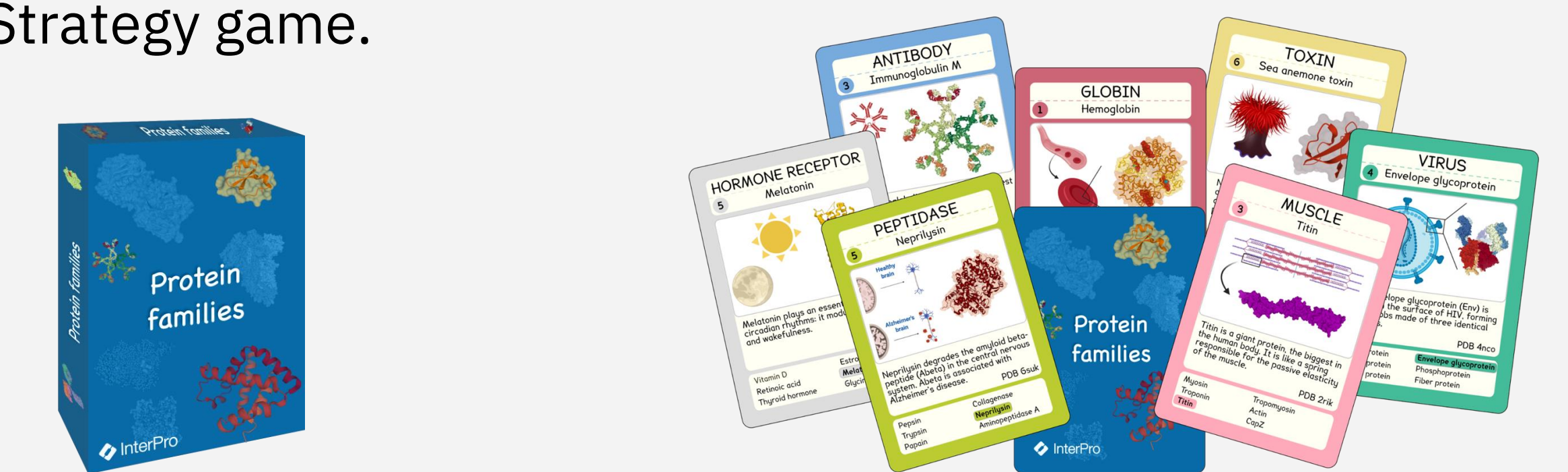
Game development stages

The game cards have been designed iteratively following feedback received from scientific and non-scientific audiences.



Highlights

- The main objective of this game is for the players to have fun whilst learning new things about proteins, without necessarily being aware of it.
- Designed for a target audience of 16-18 years old, but can be played at any age.
- Can be used by teachers to introduce the concept of proteins and protein families.
- Thoughtful design for audiences with dyslexia and color blindness
- Online version suitable for people in the neurodiverse spectrum.
- Strategy game.



Card content

Each card contains interesting information about the proteins, and allows to explore the beauty of protein structures through the 3D visualisation.

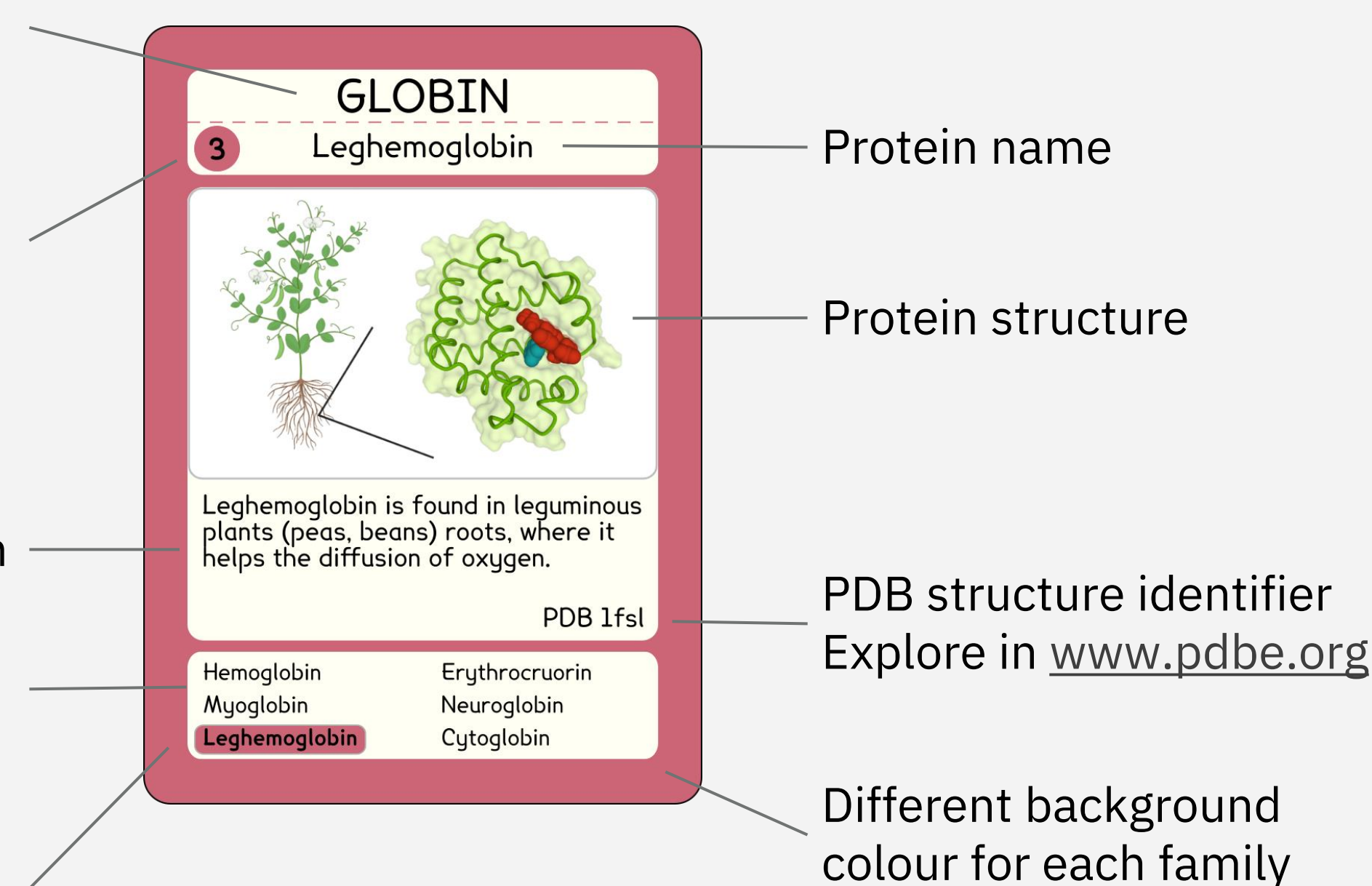
Protein family name
Explore in www.ebi.ac.uk/interpro

Protein card number in the family

Fun fact about the protein

Members of the protein family to collect

The current protein in the family is highlighted with a coloured background



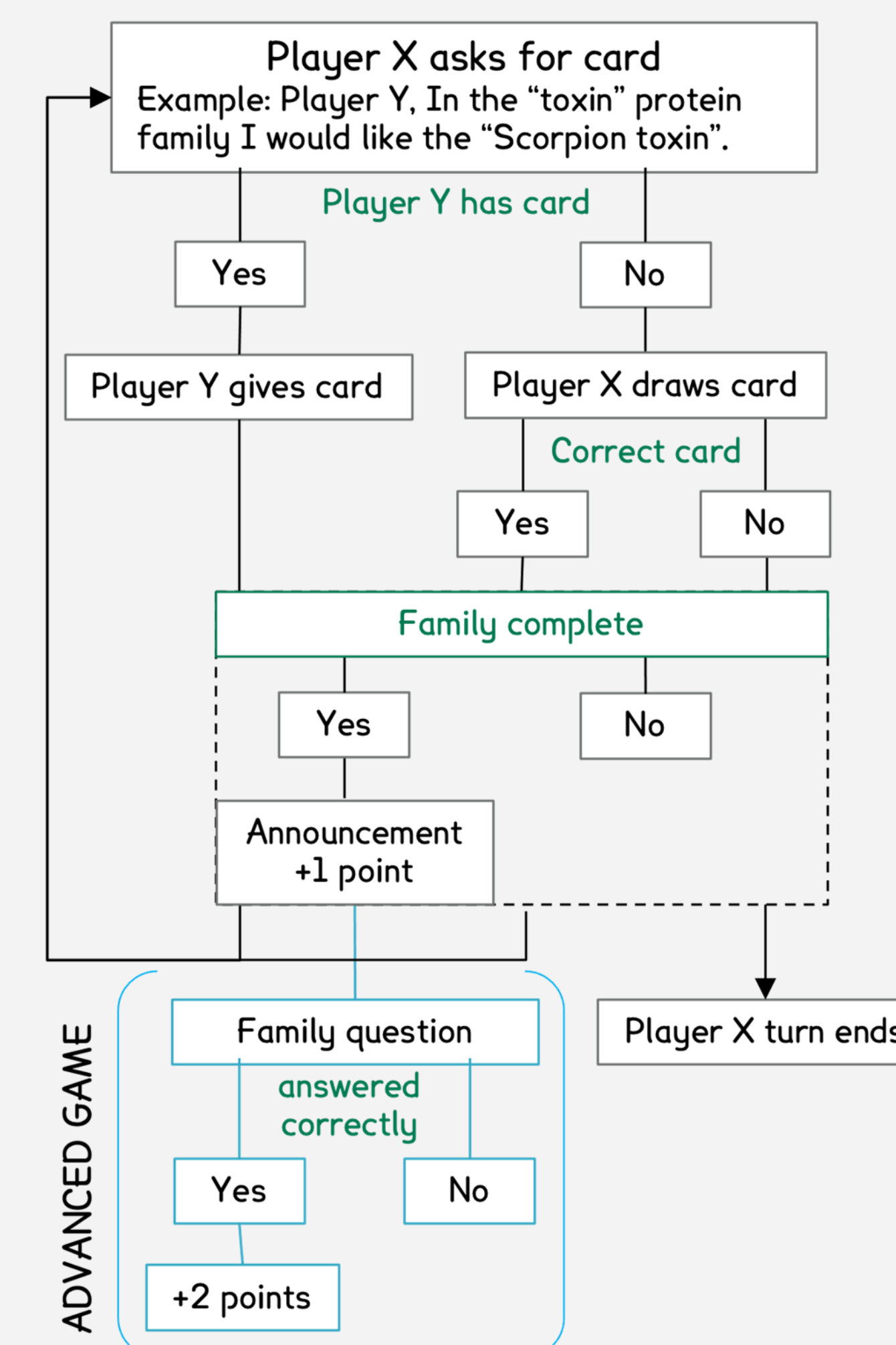
Game logic



The game logic is similar to the *Happy families* and *Go Fish* games: players need to complete the maximum number of protein families. When a family is completed, the player gets one point.

The game offers different playing modes:

- Easy: players are asking for cards using the family colour and cards numbers
- Medium: players are asking for cards using family and protein names
- Advanced: same logic as the medium mode, but players can get two additional points if they answer correctly to a "family question", asked by another player.



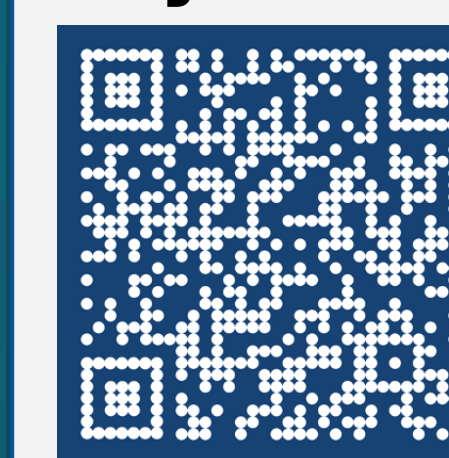
Conclusion and future work

The protein families game has been played by English students, scientists and non-scientists from 7 to 60+ years old. It has received very enthusiastic comments, such as "Fun way to learn", "Educational", "Strategic", "Fun", "Addicting".

Future work

- Develop an educational page in the InterPro website, where teachers will be able to find resources to introduce the concept of protein classification to their students.
- Translate the game in different languages

Try it out!



Interested to learn more about the game or get a printed copy?
Contact us: typhaine@ebi.ac.uk

<https://tabletopia.com/games/protein-families>