Undergraduate biology students often conflate gene expression with Punnett squares and traits.

Student Ideas About Gene Expression: Making Proteins vs. Punnett Squares

RESULTS

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INTRODUCTION

Molecular biology makes use of visualizations to represent concepts that cannot be observed. Student-generated drawings can give insight into their mental models of molecular processes and can reveal previously unknown areas of confusion.

METHODS

Interviews were conducted with undergraduates (n=22) and biology faculty members (n=17), who were asked to draw and explain gene expression. Then, biology undergraduates (n=51) were surveyed to confirm initial findings that confusion about gene expression is a widespread issue among learners.

DISCUSSION

Undergraduate biology students commonly described gene expression using Punnett square drawings and representations of traits instead of describing the processes of transcription and translation. Beginner students tended to be more deterministic in their models, while advanced students showed more sophisticated molecular reasoning.

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