Introduction

- FKBP51(51) is a glucose receptor-associated protein

  
  **Glucocorticoid Receptor Function**
  1. Glucocorticoids are hormones in the bloodstream
  2. Glucocorticoids diffuse into cells & combine with the glucose receptor to activate the receptor
  3. Activated receptors interact with DNA to cause gene expression

- FKBP51 affects the glucose receptor function by *inhibiting* hormone binding to the receptor
- FKBP51 levels are *very high* in squirrel monkeys and *very low* in humans. To compensate the squirrel monkey has high levels of cortisol in the blood
- The focus of the research is to:
  - Isolate the squirrel monkey promoter sequence
  - Compare the squirrel monkey promoter to the human promoter
  - Look for differences that may explain different expression of FKBP51 in the squirrel monkey vs. the human

Genome Walking and PCR

- PCR was performed using a primer targeting the adaptor and a primer targeting squirrel monkey sequence
- The PCR product contains a small amount of unknown squirrel monkey sequence and a large amount of previously unknown squirrel monkey sequence
- Gel Electrophoresis and gel extraction was used to separate and analyze the products.

Results

Sequence Composition of Squirrel Monkey vs. Human FKBP51 Promotor

Comparison of Squirrel Monkey and Human FKBP51 Promoter Sequences

Conclusions

- The squirrel monkey and human promoter sequences show a high degree of similarity, especially in the proximal region, up to 500 bp upstream of the transcription start site.
- Comparison of DNA sequence further upstream in the promoters show less similarity.
- The squirrel monkey promoter is missing two regions (approximately 250 bp and 150 bp) that are found in the human promoter. These regions are present as repeat elements in the human promoter.
- Individual differences in human promoter sequences (polymorphisms) have been associated with altered expression of FKBP51 and psychiatric disorders such as depression.
- The squirrel monkey sequence will be scanned for polymorphisms associated with disorders in humans.

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References

