

Correlation analysis between CD4 T Cell counts and genetic diversity indicate no relationship

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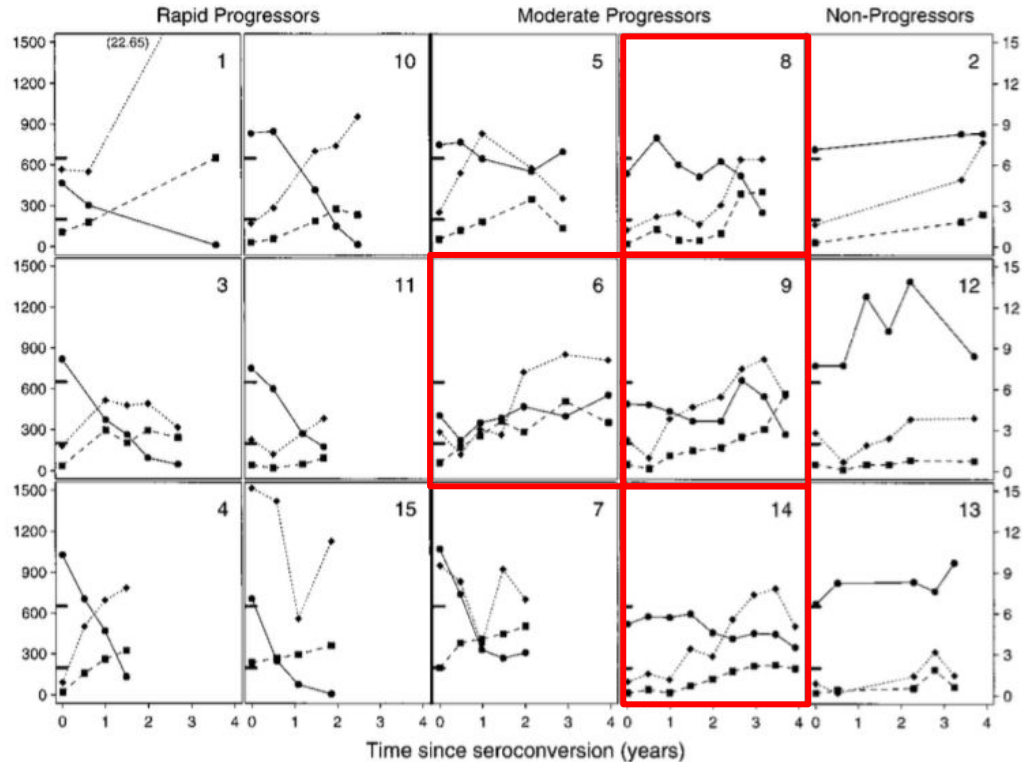
Outline

- **Markham et al. indicated a relationship between increased genetic diversity and divergence, and a decrease in CD4 T cell counts.**
- **Markham et al. analyzed their data according to three progressor groups instead of a correlation across all data points.**
- **A trend exists between genetic diversity and CD4 T cell counts, but it could not be confirmed through correlation analysis.**
- **Other studies indicate a correlation between genetic diversity and progression of HIV-1.**

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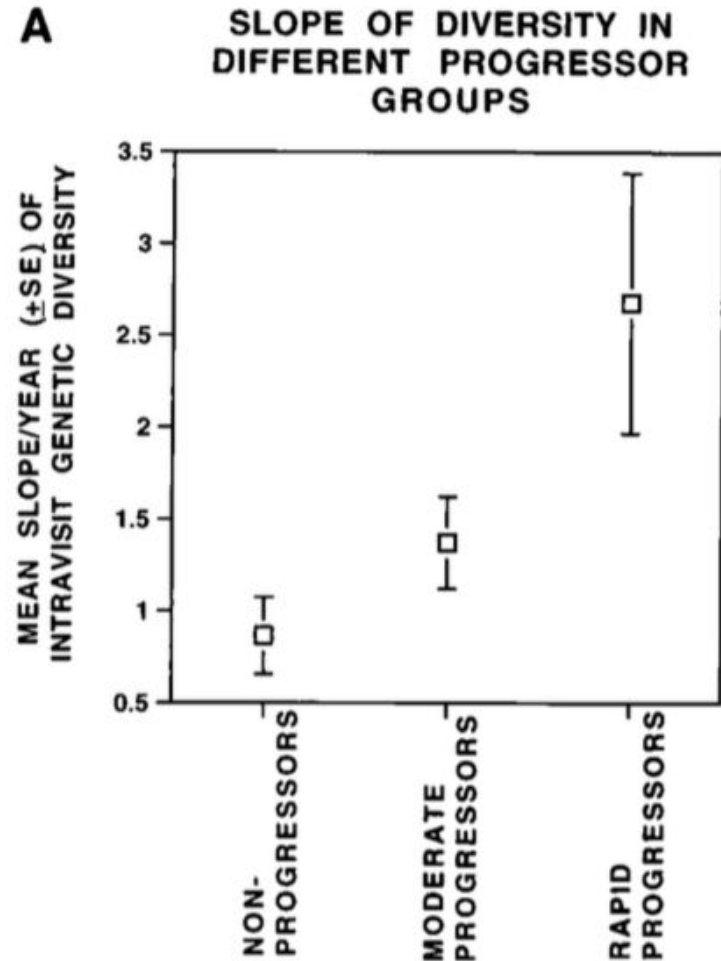
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Variable declines in CD4 T Cell Counts were observed across all 15 participants.



A significant difference in rate of genetic diversity existed between rapid progressors and moderate progressors.

- No such relationship between non-progressors and moderate progressors.



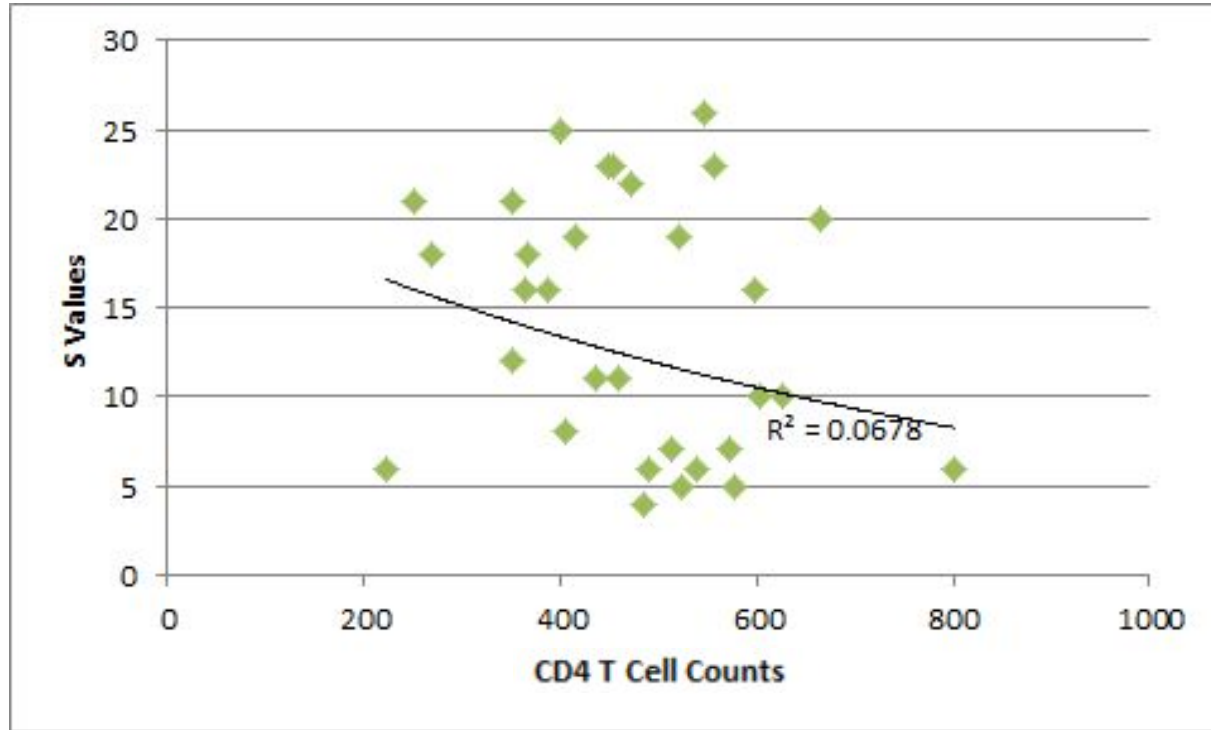
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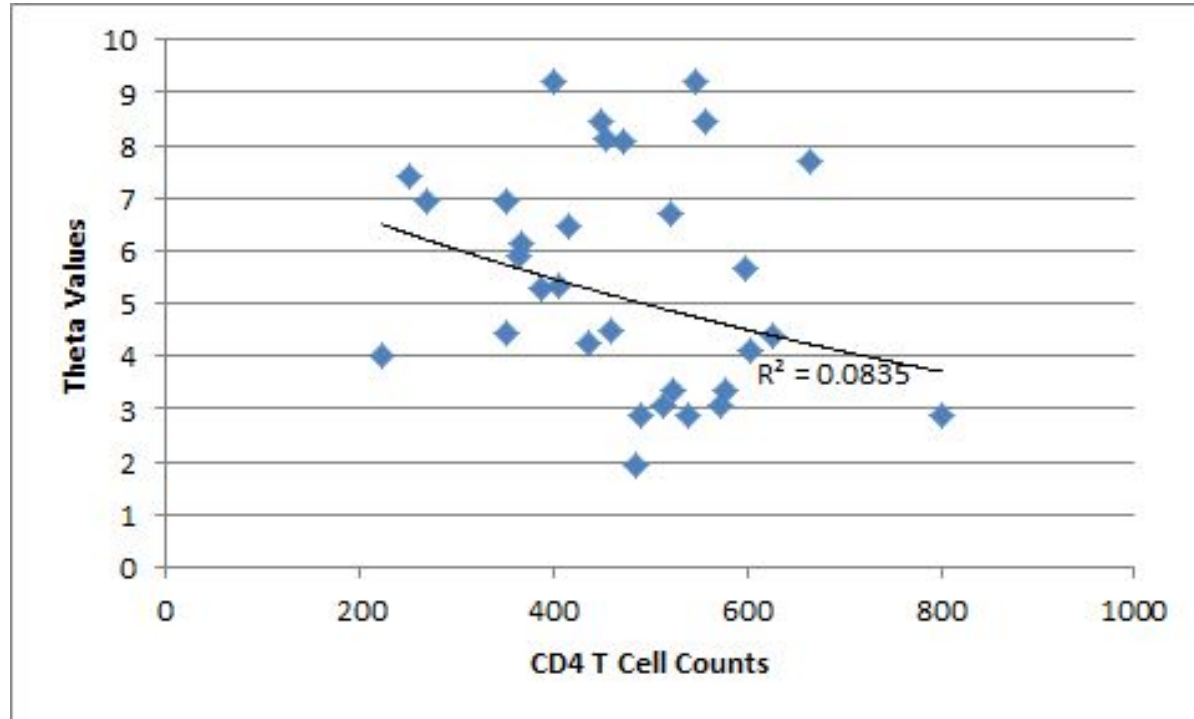
Correlation analysis between genetic diversity and CD4 T Cell count should result in an inverse relationship.

- **Subjects 6, 8, 9, and 14 were analyzed**
 - **Had the most number of clones across the most visits**
- **CD4 T cell counts were plotted against both S and theta values**
- **Direct correlation and trends over time were analyzed**
- **Rooted trees were created of each subject**
 - **Signify relationship between different clones**

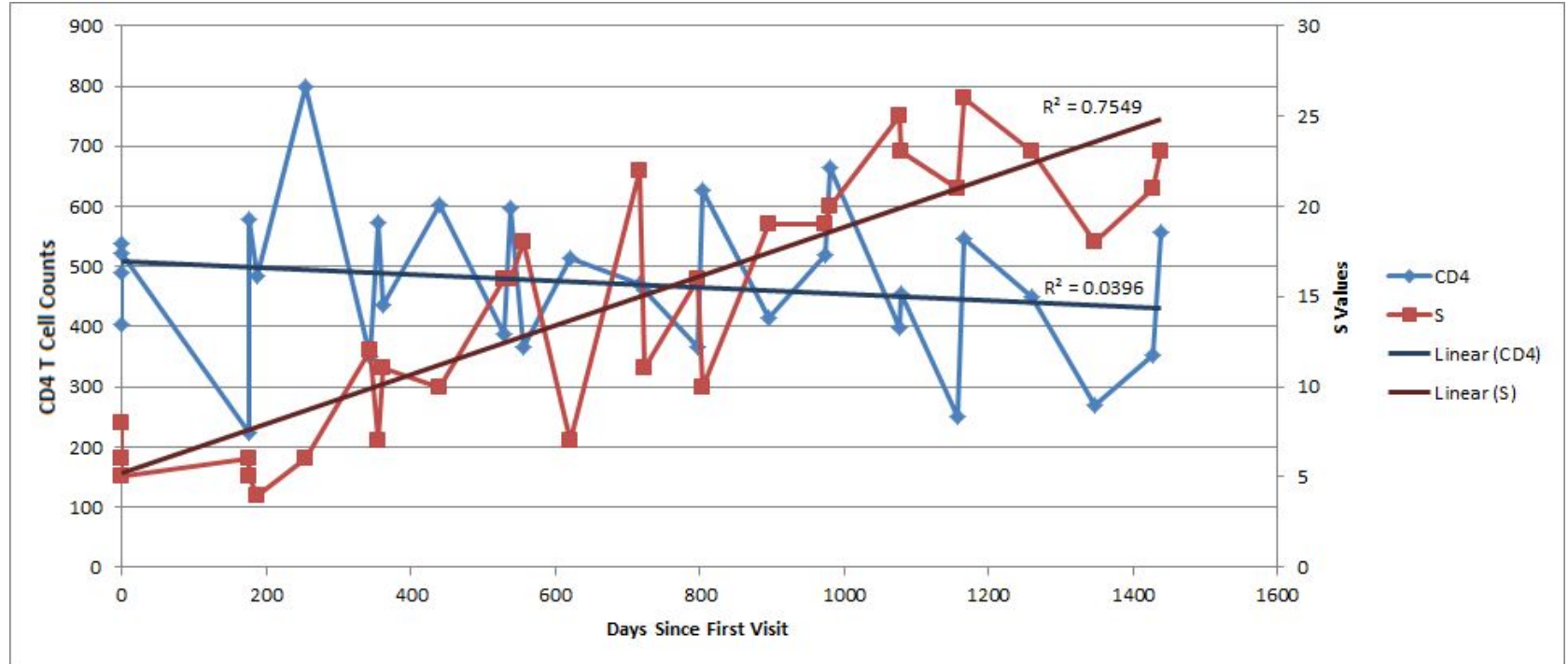
No correlation exists between S values and CD4.



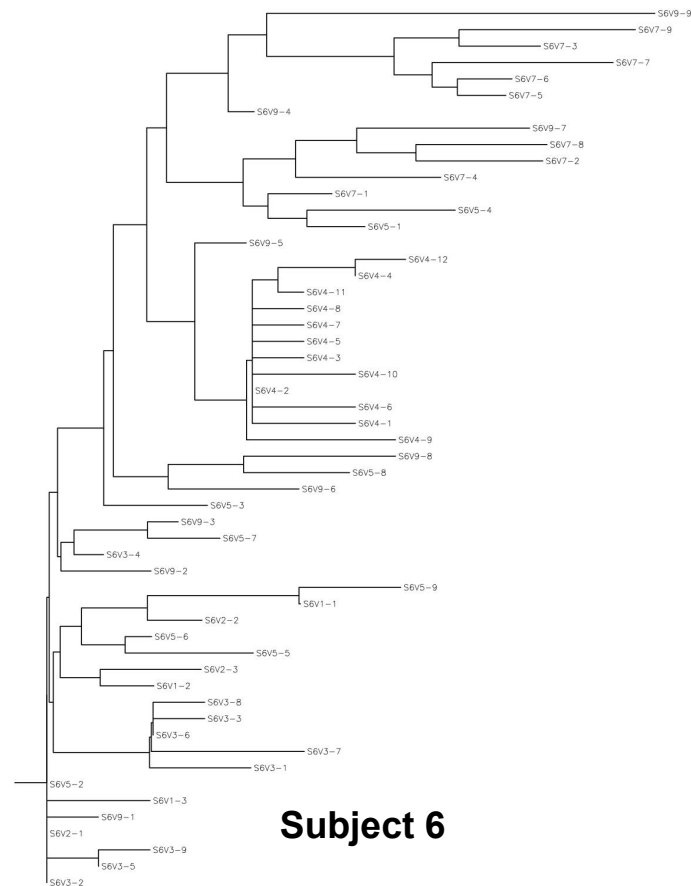
No correlation exists between theta values and CD4.



Inconclusive trend exists between genetic diversity and CD4 counts over time.



Rooted Trees indicate genetic diversity between visits.



Subject 6



Subject 8

Rooted Trees indicate genetic diversity between visits.



Subject 9



Subject 14

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- **Other studies indicate a correlation between genetic diversity and progression of HIV-1.**

No correlation was found between CD4 T cell count and genetic diversity.

- **However, inconclusive trend appears over time.**
- **With more data points across more subjects, a more conclusive result could have been found.**
- **Rooted trees and current sequence data are only representative of genetic diversity with greater numbers of clones per visit.**
- **Rachinger et al. found that CD4 counts are representative of viral diversity and immune activation.**
 - **Theta values were used to determine genetic diversity, and patients were sorted into three groups based on genetic diversity.**
- **Araujo et al. explained that genetic diversity of the Env gene has been studied extensively, but the functional diversity of these proteins has not.**

More data is required to complete a correlation analysis between CD4 T cell counts and genetic diversity.

- **More participants across more visits and more clones per visit**
- **Increased sophistication in calculating genetic diversity**
 - **HRM scores are a comprehensive analysis method of studying genetic diversity**
 - **Encompass differences in synonymous and nonsynonymous mutations affecting DNA melting point and insertions and deletions**
 - **James et al.**

Summary

- **Markham et al. indicated a relationship between increased genetic diversity, and a decrease in CD4 T cell counts.**
- **Data was analyzed using a correlation analysis across all participants' CD4 T cell counts and genetic diversity.**
- **A trend exists between genetic diversity and CD4 T cell counts, but it could not be confirmed through correlation analysis.**
- **Other studies indicate a correlation between genetic diversity and progression of HIV-1.**
- **More data points are required in order to confirm the results of our correlation analysis.**

References

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