

**P031** Analysis of a genetic cross between fluorescent trypanosomes

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*Trypanosoma brucei* undergoes genetic exchange in its insect vector, the tsetse fly, by an unknown mechanism. To visualize the production of hybrids in the fly, genes encoding fluorescent markers (GFP, mRFP) were integrated into the genomes of the parental trypanosome clones. Genetic crosses of red and green parental trypanosomes produced progeny with red, green, yellow or no fluorescence, consistent with Mendelian segregation and reassortment of the reporter genes. Hybrid genotypes of progeny clones were confirmed by microsatellite and molecular karyotype analysis. Yellow hybrids were easily visualized in the fly and were observed only in flies with mixed red and green salivary gland infections. Even though most infected flies had a co-infection of red and green trypanosomes in the midgut, yellow trypanosomes were never observed in the midgut or proventriculus. We conclude that genetic exchange occurs among trypanosomes in the salivary glands and that the only prerequisite for genetic exchange is co-infection of a salivary gland with both parental trypanosomes. The high frequency of hybrid production observed in this cross, together with the easy visualization of hybrids, has allowed us to identify the lifecycle stage involved, to search for intermediates in the process and to explore the requirements for genetic exchange.