Long monochromatic paths

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The *size-Ramsey number* $\hat{r}(F)$ of a graph F is the smallest integer m such that there exists a graph G on m edges with the property that any coloring of the edges of G with two colors yields a monochromatic copy of F. First we focus on the size-Ramsey number of a path P_n on n vertices. In particular, we show that $5n/2 - 15/2 \leq \hat{r}(P_n) \leq 74n$ for n sufficiently large improving the previous lower bound due to Bollobás and the upper bound due to Letzter. Next we study long monochromatic paths in edge-colored random graph $\mathcal{G}(n,p)$ with $pn \to \infty$. We also consider a related problem and study the size of the largest monochromatic components in edge-colored $\mathcal{G}(n,p)$. Some of the proofs use the (sparse) regularity lemma. This is a joint work with P. Prałat.