1052-13-282 **Jeff A Mermin*** (mermin@math.okstate.edu), Department of Mathematics, Oklahoma State University, Stillwater, OK 74078, and **Satoshi Murai**. *The lex-plus-powers conjecture holds for pure powers.*

Let $R = k[x_1, \ldots, x_n]$ be a polynomial ring. Let $F = (f_1, \ldots, f_r)$ be a homogeneous regular sequence with $\deg(f_i) = e_i$ and $e_1 \leq \cdots \leq e_r$. Put $P = (x_1^{e_1}, \ldots, x_r^{e_r})$. The Lex-Plus-Powers conjecture asserts the following:

(1) Let $I$ be any ideal containing $F$. Then there exists a lex ideal $L$ such that the lex-plus-powers ideal $L + P$ has the same Hilbert function as $I$.

(2) The graded Betti numbers of $L + P$ are all greater than or equal to those of $I$.

Part (1), on its own, is the Eisenbud-Green-Harris conjecture. Both are open.

We prove the lex-plus-powers conjecture in the case that $F = P$. (Received August 31, 2009)