Repression of GAP-43 expression in cultured adult DRG neurons by L8 myotubes.

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The mechanism regulating the transition of immature, growing neurons into phenotypically mature neurons is unknown, but may involve a retrograde signal generated upon target innervation. Maturation of dorsal root ganglion (DRG) neurons is characterized by down-regulation of the growth-associated proteinGAP-43 late in development. Peripheral axotomy of adult DRG neurons causes up-regulation of GAP-43 in association with regenerative growth, then down-regulation when target contact is reestablished.

We have used cell-ELISA to examine the expression of GAP-43 in adult DRG neurons cultured in the presence of L8 cells, a myogenic cell line able to spontaneously form myotubes in vitro. GAP-43 expression, normally high in axotomized, cultured adult DRG neurons, was repressed when DRG neurons were grown in the presence of L8 cells, but not 3T3 (fibroblast like) or FR (skin cells). Gap-43 repressive activitywas retained in L8 conditioned medium (L8CM) and in washed L8 membrane fragments (L8MF), suggesting the presence of both secreted and membrane bound repressive factors. Maximum repressive activity of both L8CM and L8MF was recovered was recovered from L8 cultures at the stage of initial myotube formation. GAP-43 repression by L8CM and L8MF appeared to correlate with reduced DRG neurite density. DRG neuron counts indicated that decreases in GAP-43 and neurite density were not associated with neuron loss. These findings suggest that L8 myotubes produce a factor which can promote acquisition of at least one feature of a mature phenotype in DRG neurons.

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