

Annotate to Process or Process Regulation? Phenotypes, the IMP Evidence Code, and Muscle Contraction

muscle contraction, GO:0006936

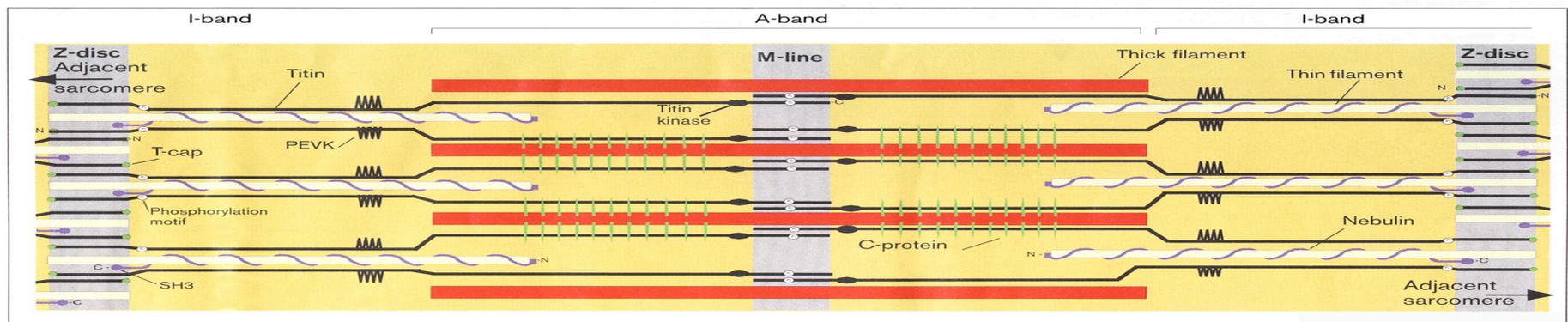
Definition:

A process whereby force is generated within muscle tissue, resulting in a change in muscle geometry. Force generation involves a chemo-mechanical energy conversion step that is carried out by the actin/myosin complex activity, which generates force through ATP hydrolysis. [source: GOC:ef, GOC:mtg_muscle, [ISBN:0198506732](#)]

regulation of muscle contraction, GO:00069367

Definition:

Any process that modulates the frequency, rate or extent of muscle contraction. [source: GOC:go_curators]

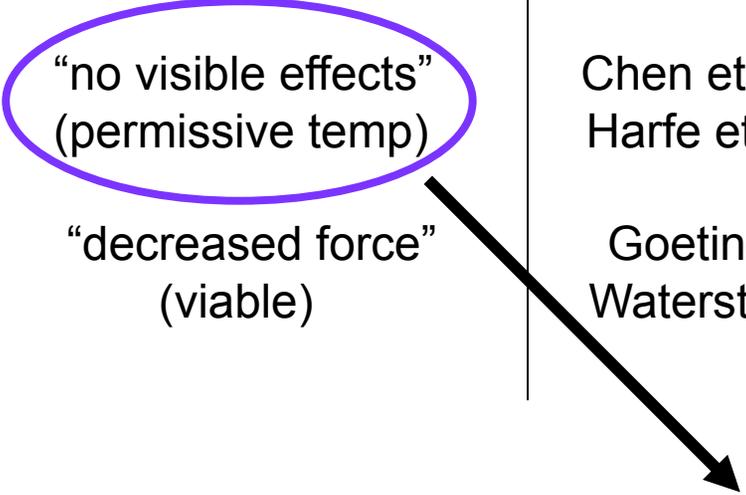


Different alleles of the same gene can give different phenotypes

Gene name	Loss-of-function phenotype	Reduced function phenotype	Reference
egl-19	no contractions (lethal)	“feeble contractions” (viable)	Lee et al., 1997
hlh-1	“weak contractions” (lethal)	“no visible effects” (permissive temp)	Chen et al., 1994 Harfe et al., 1998
unc-54	no contractions (viable)	“decreased force” (viable)	Goetinck and Waterston, 1994

Reduced function mutation at permissive temperature: No annotation!

Gene name	Loss-of-function phenotype	Reduced function phenotype	Reference
egl-19	no contractions (lethal)	“feeble contractions” (viable)	Lee et al., 1997
hlh-1	“weak contractions” (lethal)	“no visible effects” (permissive temp)	Chen et al., 1994 Harfe et al., 1998
unc-54	no contractions (viable)	“decreased force” (viable)	Goetinck and Waterston, 1994



No annotation

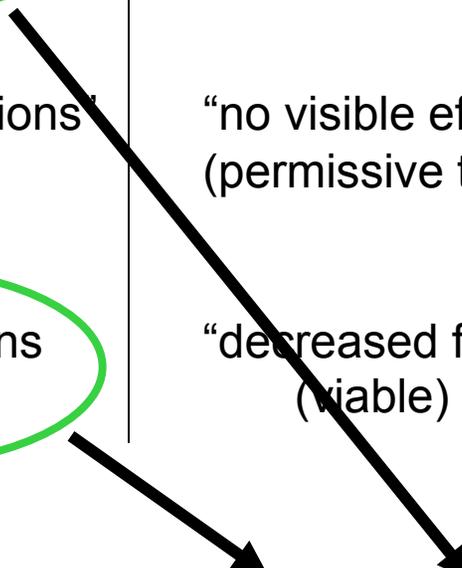
Decreased frequency, rate, extent: Regulation annotations?

Gene name	Loss-of-function phenotype	Reduced function phenotype	Reference
egl-19	no contractions (lethal)	"feeble contractions" (viable)	Lee et al., 1997
hlh-1	"weak contractions" (lethal)	"no visible effects" (permissive temp)	Chen et al., 1994 Harfe et al., 1998
unc-54	no contractions (viable)	"decreased force" (viable)	Goetinck and Waterston, 1994

Regulation of muscle contraction?

No muscle contraction at all: annotate to parent term?

Gene name	Loss-of-function phenotype	Reduced function phenotype	Reference
egl-19	no contractions (lethal)	“feeble contractions” (viable)	Lee et al., 1997
hlh-1	“weak contractions” (lethal)	“no visible effects” (permissive temp)	Chen et al., 1994 Harfe et al., 1998
unc-54	no contractions (viable)	“decreased force” (viable)	Goetinck and Waterston, 1994



Muscle contraction?

Does knowing the molecular identity change your mind?

Gene name	Loss-of-function phenotype	Reduced function phenotype	Reference
egl-19 voltage-gated calcium channel	no contractions (lethal)	“feeble contractions” (viable)	Lee et al., 1997
hlh-1 bHLH transcription factor	“weak contractions” (lethal)	“no visible effects” (permissive temp)	Chen et al., 1994 Harfe et al., 1998
unc-54 myosin heavy chain A	no contractions (viable)	“decreased force” (viable)	Goetinck and Waterston, 1994