

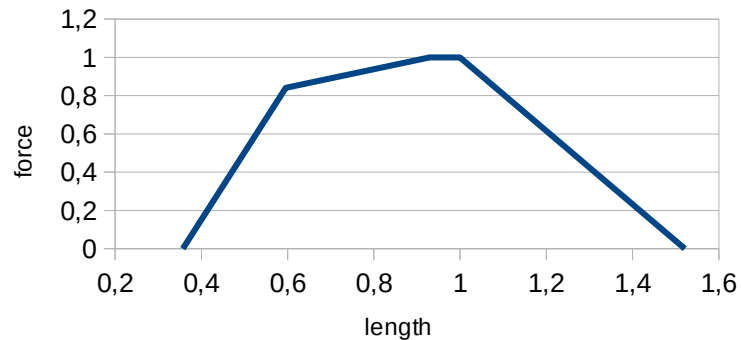
## A adapted trans iso Mooney-Rivlin model (Gordon 1966) (beta version)

### 1. Introduction

This plugin uses as basis the material type transversely isotropic Mooney Rivlin. And additionally, the force-length-curve by Gordon et al. (1966) for the active contraction. With this, you can simple change the muscle properties for different muscle types.

### 2. Adaptations

```
m_ax = 0.357;  
m_ay = 0;  
m_bx = 0.596;  
m_by = 0.84;  
m_cx = 0.929;  
m_cy = 1;  
m_dx = 1;  
m_dy = 1;  
m_ex = 1.521;  
m_ey = 0;
```



```
if (m_ascl > 0)  
{  
    double ctenslm = m_ascl; // activation scale factor  
    double WI = 0;  
    /*if (lamd < m_ax) WI = 0;  
    else*/ if (lamd < m_bx) WI = m_ay + (lamd-m_ax)*((m_by-m_ay)/(m_bx-m_ax));  
    else if (lamd < m_cx) WI = m_by + (lamd-m_bx)*((m_cy-m_by)/(m_cx-m_bx));  
    else if (lamd < m_dx) WI = m_cy + (lamd-m_cx)*((m_dy-m_cy)/(m_dx-m_cx));  
    else if (lamd < m_ex) WI = m_dy + (lamd-m_dx)*((m_ey-m_dy)/(m_ex-m_dx));  
    /*else WI = 0;*/  
    saf = ctenslm * (m_smax * WI); // activation * (max stress * W on lamd)  
}
```

### 3. Example

```
<material id="1" lc="1" type="gordon1966">  
  <c1>0.1152</c1> <!-- MPa - Vogt 2006 -->  
  <c2>0.0540</c2> <!-- MPa - Vogt 2006 -->  
  <c3>0.05</c3> <!-- dimensionless - Röhrle 2008 -->  
  <c4>6.6</c4> <!-- dimensionless - Röhrle 2008 -->  
  <c5>2.1751</c5> <!-- dimensionless - Röhrle 2008 -->  
  <k>2.08</k> <!-- MPa - 100 < K/C1 < 10000 - water=2.08E9 -->  
  <lam_max>1.4</lam_max>  
  <smax>1</smax>  
</material>  
  
<loadcurve id="1">>  
  <loadpoint>0,0</loadpoint>  
  <loadpoint>1,1</loadpoint>  
</loadcurve>
```

### 4. Literature

Gordon AM, Huxley AF, Julian FJ. The variation in isometric tension with sarcomere length in vertebrate muscle fibres. *The Journal of Physiology*. 1966;184(1):170-192.