From: "Katherine K. Perkins" <Katherine.Perkins@Colorado.EDU>
Subject: **Fwd: model**
Date: September 25, 2007 1:11:36 PM MDT
To: Chris Malley <cmalley@pixelzoom.com>
1 Attachment, 183 KB Save Slideshow

Chris,

My brother has reworked the model for calculating the velocity of the DNA
Force is in pN.
ATP is in arbitrary units (0-10)

And the velocity returns in units of nm/s

I realize that this code doesn't exactly match what I gave you, but I hope its not too much work to replace the model I gave you with this new model that my brother developed to accomodate the 2 different enzymes.

Let me know if you need more information or need to talk about the syntax of this programming. The stuff at the top is all just initializing vectors and variables (force, velocity, and all the variables)

Kathy

> From: tperkins <tperkins@Colorado.EDU>
> To: "'Katherine K. Perkins'" <Katherine.Perkins@Colorado.EDU>
> Subject: model
> Date: Tue, 25 Sep 2007 20:29:06 -0600
>
> Hi Kathy,
>
> You give the routine a force and a ATP level, and it returns a velocity. The Force is actually a vector (a wave in the language of igor).
>
> Tom
>
> ```
> Model 1
>
> function fv (force, velocity, ATP)
>
>     wave    force, velocity
>     Variable ATP
>     variable kt, kcat0,kb0
>
>     Variable pc,qc,delta_cat
>     Variable pb,qb,delta_b, d
>
>     kt    = 4.1
>     kcat0 =700
>
>     kb0 = kcat0/2
>     pc =1
>     qc =.09
>     pb = 2
>     qb = .1
>     delta_cat = 4 *.82
> ```

```
		delta_b = 4*1.2
		d = 8
		duplicate/o force, bolt_cat,bolt_b,kcat,kb

		bolt_cat = exp(Force*delta_cat/kt)
		bolt_b= exp(Force*delta_b/kt)


		kcat = kcat0/(pc + qc *bolt_cat)
		kb = kb0/(pb + qb *bolt_b)

		Velocity = d*kcat*ATP/(ATP + (kcat/kb))

End

Model 2
function fv2 (force, velocity, ATP)

		wave	force, velocity
		Variable ATP
		variable kt, kcat0,kb0

		Variable pc,qc,delta_cat
		Variable pb,qb,delta_b, d

		kt	= 4.1
		kcat0 =6500

		kb0 = kcat0/2
		pc =10
		qc =.09
		pb = 20
		qb = .1
		delta_cat = 4 *.01
		delta_b = 4*1.4
		d = 8
		duplicate/o force, bolt_cat,bolt_b,kcat,kb

		bolt_cat = exp(Force*delta_cat/kt)
		bolt_b= exp(Force*delta_b/kt)


		kcat = kcat0/(pc + qc *bolt_cat)
		kb = kb0/(pb + qb *bolt_b)

		Velocity = d*kcat*ATP/(ATP + (kcat/kb))

end
```

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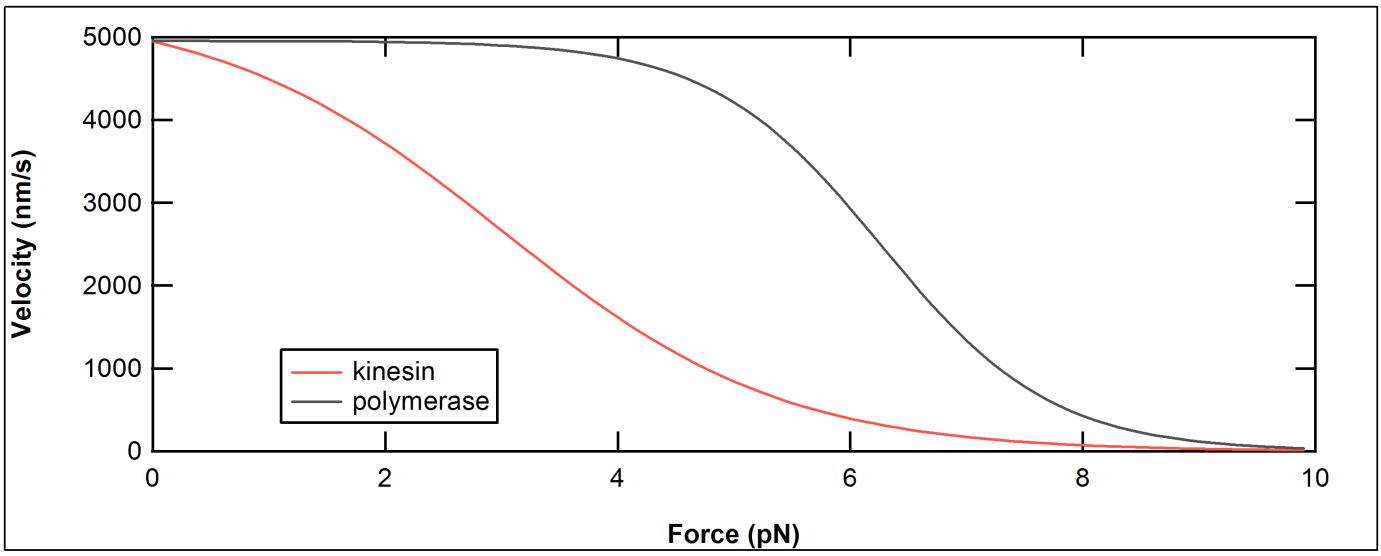

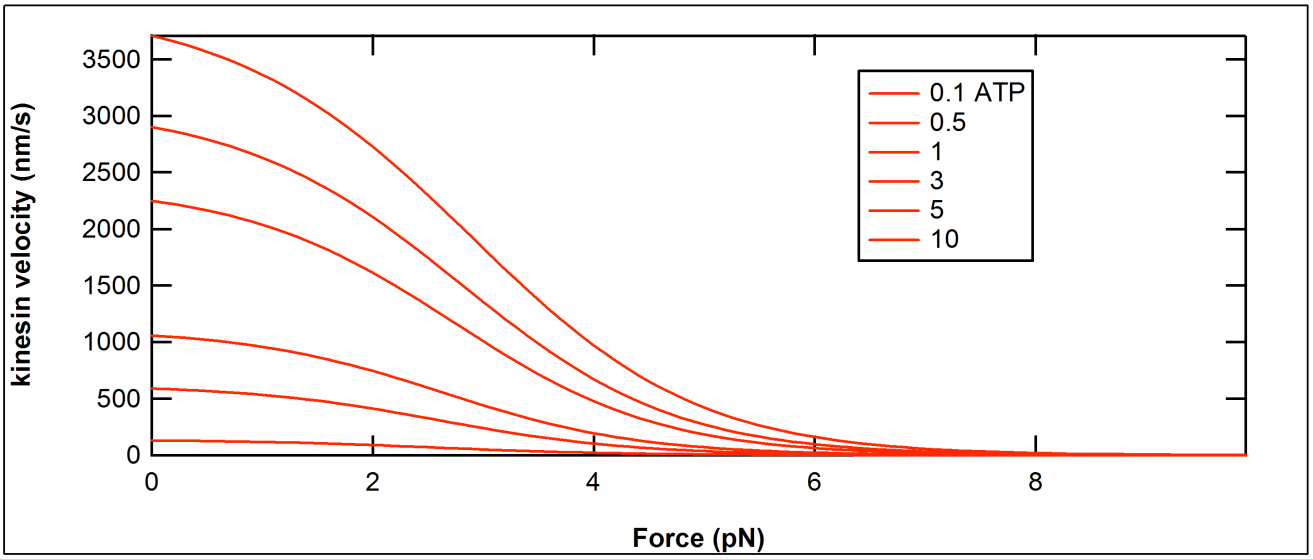

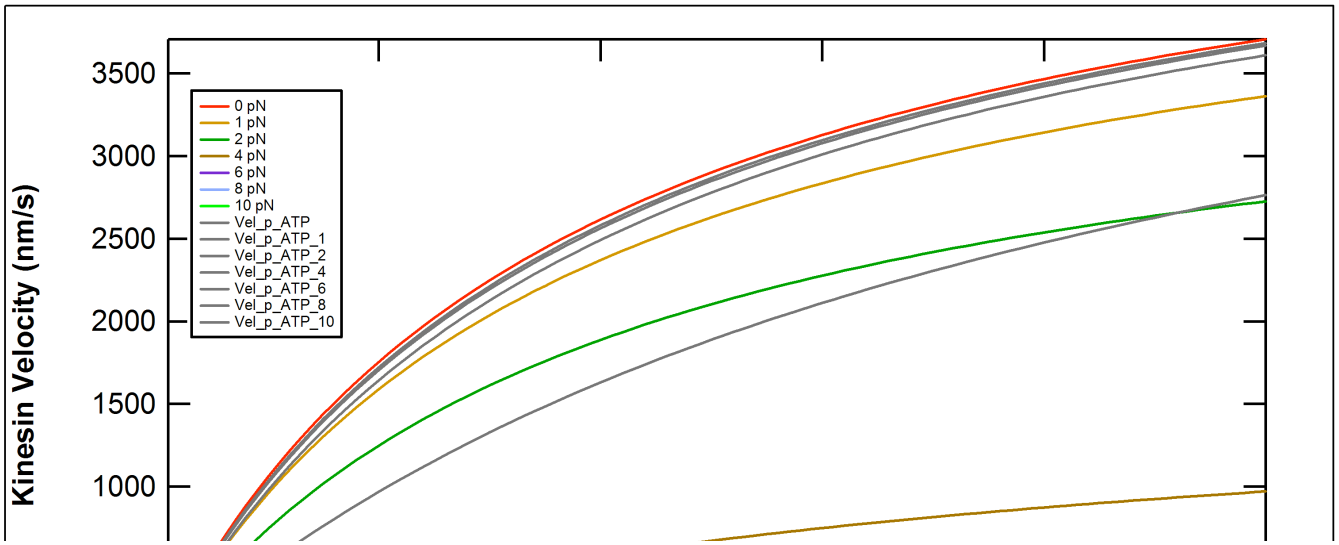

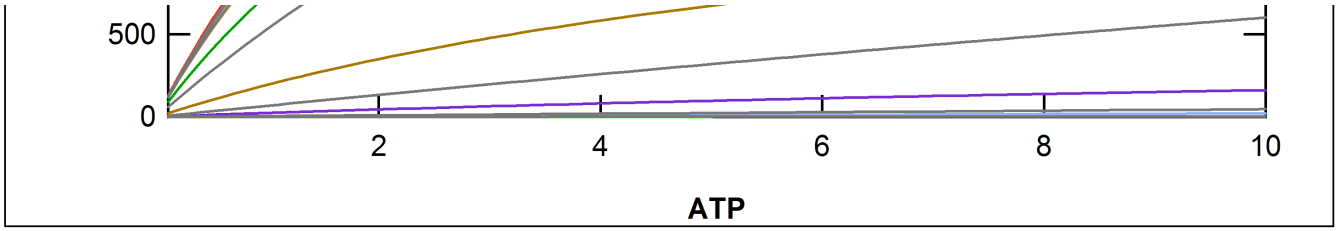
500
0
2
4
6
8
10
ATP