



Centre for
Pain Medicine

Principles and physics of redoxPRF

Menno E.Sluijter
Consultant
Center for Pain Medicine
Swiss Paraplegic Center
Nottwil, Switzerland





Responses to immunoPRF observations

- **A. A quasi-immediate inflammatory response if antigens or non-self material are present**
 - Healing of infected wounds
- **B. An attractor switch of the ANS to vagus control**
 - Latent period of 12 – 72 hrs
 - Duration up to 2 weeks
- **C. A strong anti-inflammatory effect**
 - Long duration (1 – 6 months)
 - Persisting trend
- **D. Long term: (probably) Epigenetic changes**



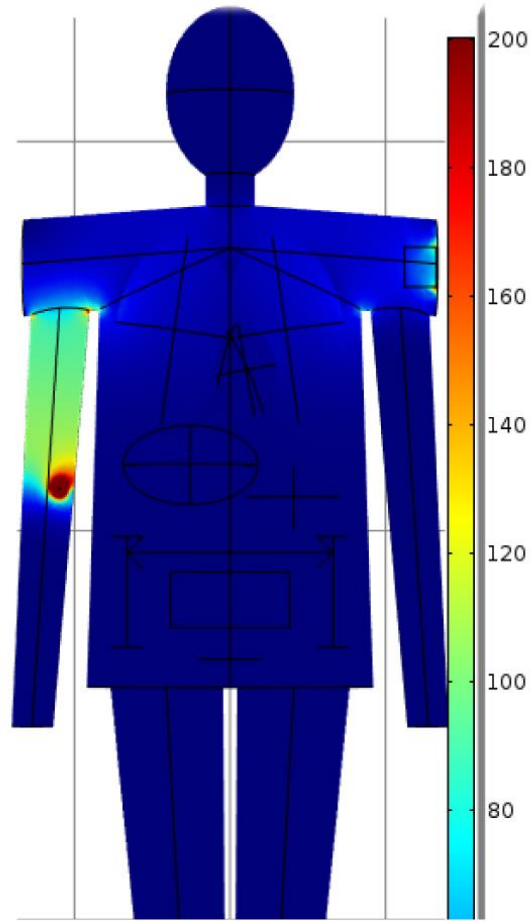
- **General treatment**
 - Skin plates on arm
 - Works on intravascular effector immune cells
- **Regional treatment**
 - Skin plates over focus
 - Works on resident immune cells



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Finite element computer simulation of IV PRF

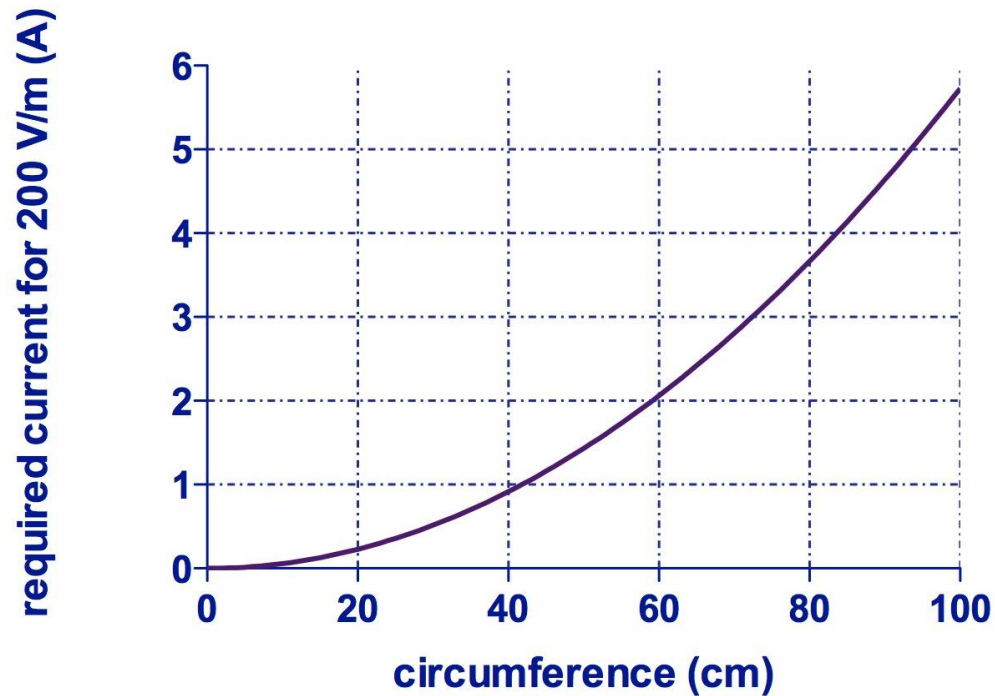
S.Rampersad, Radboud Medical Center; 2014



0-200 V/m



redoxPRF current calculations





Advantages of redoxPRF

- **Causes no sensations or discomfort**
- **No known complications**
 - **Diabetic patients must be informed**
- **Frequent treatments are not required**
- **Effect can be verified by HRV measurement (?)**
- **No effect on healthy cells**



- **Surface of the skin plates**
- **Skin plates to skin transition**
- **Subcutaneous fat**
 - $\sigma = 0.1 - 0.2 \text{ S}$ ($1 \text{ S} = 1 \text{ Ohm.m}^{-1}$)
- **Tissue impedance**
 - $\sigma = 0.35 \text{ S}$



redoxPRF

some useful formulas

- The formula governing the amplitude of the Efields is

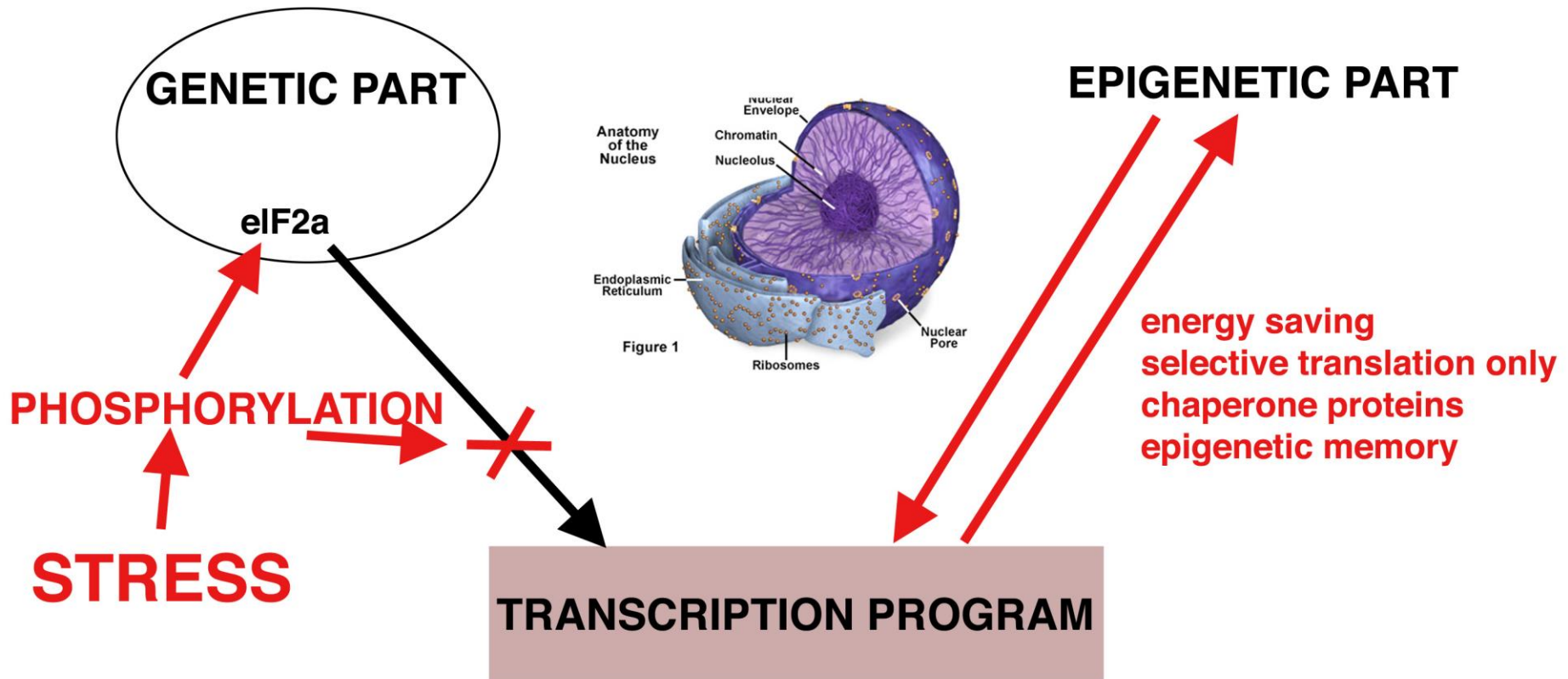
$$E = J/\sigma$$

- Where E is the Efield in V/m, and J is the current density in A/m

- $J = i/\text{surface}$



STERILE INFLAMMATION the initiation of cell stress





- **A quasi-instantaneous effect on the redox equilibrium of stressed cells**
 - Physical effect?
 - Enzymatic effect?
- **Secondary effects**
 - Reduction of oxidative stress
 - Reduction of sympathetic outflow
 - Correction of the reactivity of effector immune cells
 - ANS attractor change to vagal control
- **Epigenetic change**
 - Memory of the optimal response
 - Prolonging the effect of treatment



redoxPRF is NOT stimulation

- **Stimulation**
 - Elicits a cell response
 - Has no memory

- **redoxPRF**
 - Does not elicit a cell response
 - Basic frequency of RF >> physiological limit
 - Effect is memorized as an epigenetic mark

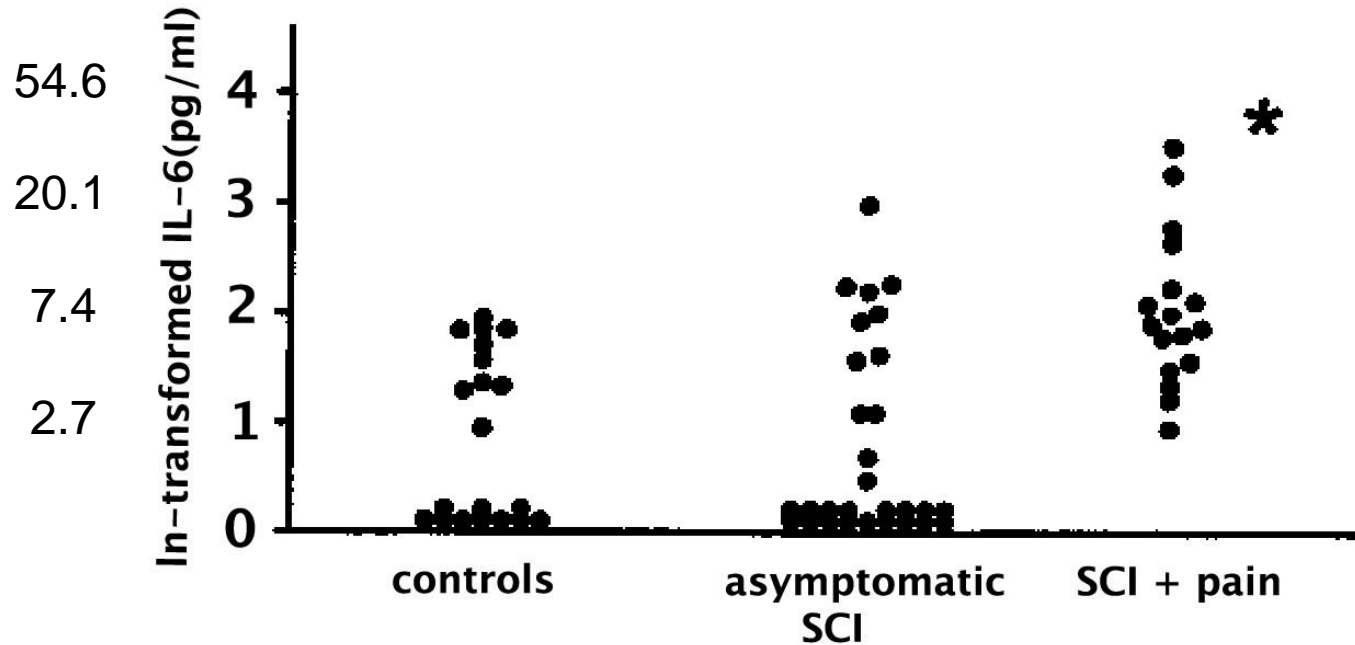


- **Acute inflammatory situations**
 - Vascular occlusion
 - Multitrauma?
- **Chronic inflammation**
 - If target has plasticity
 - Inflammaging?
- **Post infection syndromes**
 - Lyme disease
 - Mononucleosis
 - Psychiatric inflammatory conditions?



SPINAL CORD INJURY

IL-6 levels vs symptomatology



from:

Clinical Correlates of Elevated Serum Concentrations of Cytokines and Autoantibodies in Patients With Spinal Cord Injury

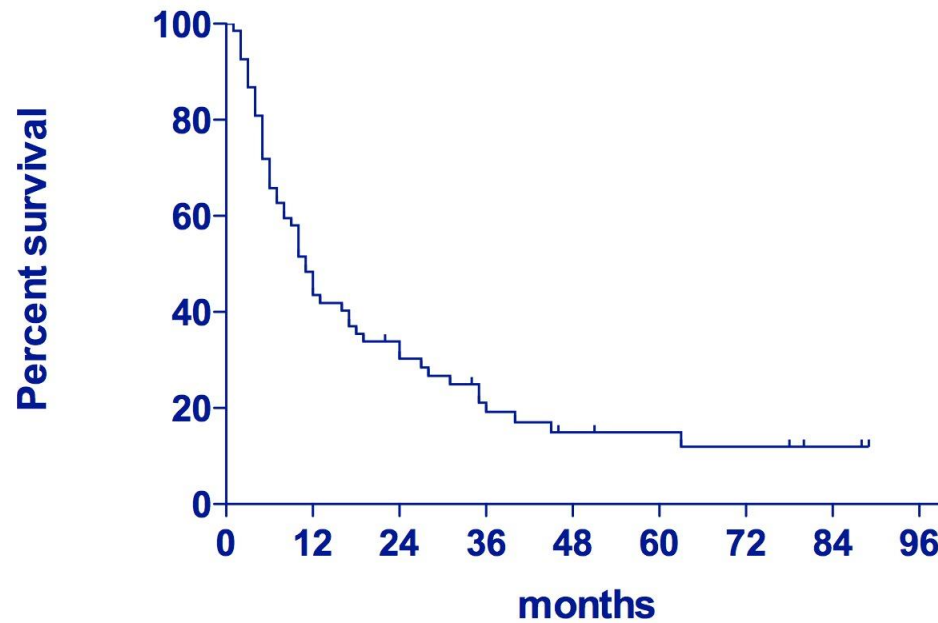
Andrew L. Davies, MSc, Keith C. Hayes, PhD, Gregory A. Dekaban, PhD

Arch Phys Med Rehabil 2007;88:1384-93.



Kaplan – Meier curve all 68 data

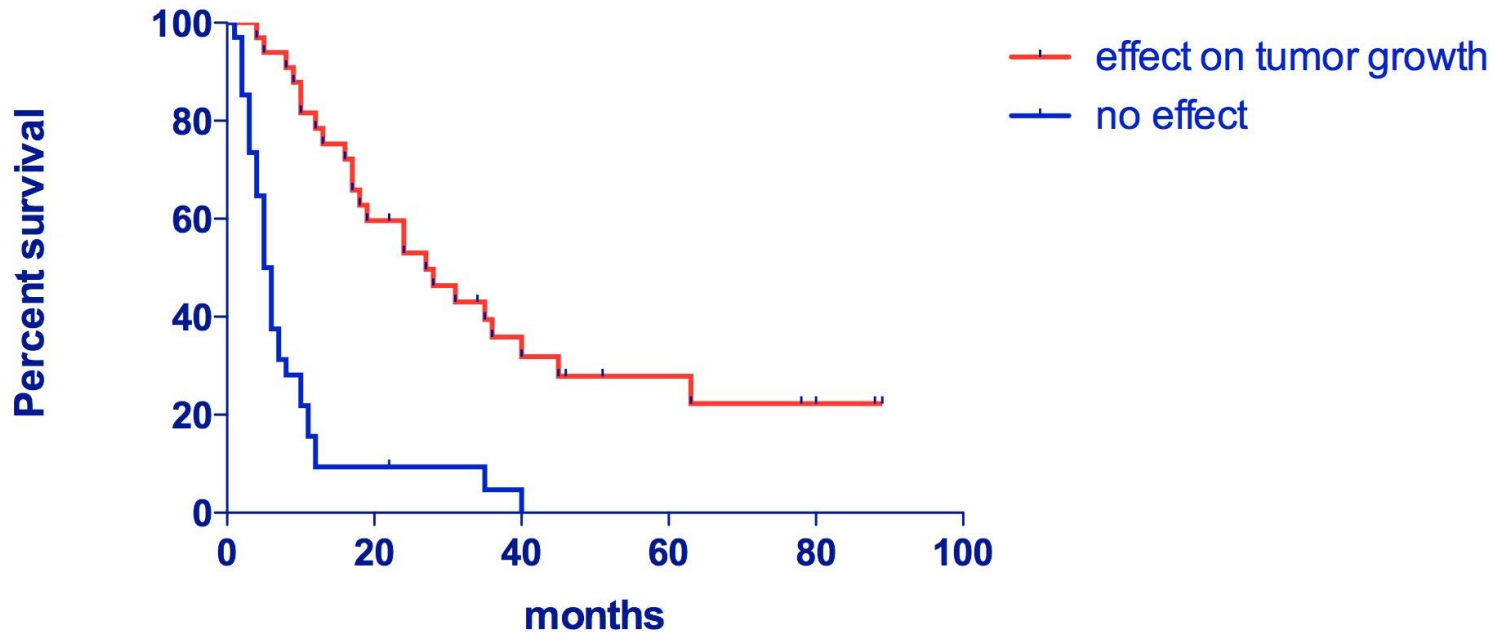
All Data: Survival proportions (n=68)





Kaplan – Meier curve effect on tumor growth (n=33)

Survival of effect on tumor growth (n=33) vs no effect





Kaplan – Meier curve effect of palliation only (n=13)

Survival of palliation only(n=13) vs no effect(n=21)

