

Mast cells, wound healing, and CGN

Presentation Randi Silver

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Notification: this report is based on my personal notes and pictures made from the presentation. Though I believe it's quite an accurate report of the presentation, I'm not responsible for misinterpretations or translation errors.

Globally 100 million people develop scars after surgical operations. Of these, 40% to 70% result in fibrotic scarring (thick scar) marked by excessive collagen deposition. This abnormal scarring can lead to pain, and contractures, and be cosmetically undesirable.

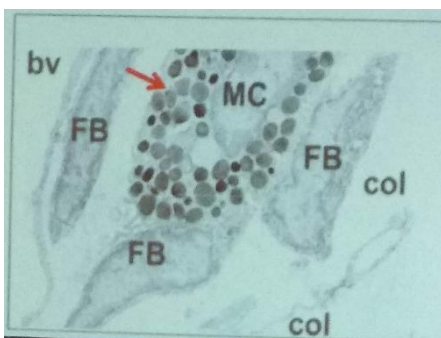
Abnormal scars (eg hypertrophic, keloid) occurs from skin incisions as a result of increased collagen synthesis and secretion. The reasons for this are unknown. Inflammation is central to the wound healing process. Mast cells are part of the inflammatory response.

MAST CELLS are important in the body of granules with a variety of chemical play important immune, allergy and infection fighting functions Silver lab has shown that mast cells can stimulate collagen production, the major component of hypertrophic / keloid scars. .

Mast cells are found in the dermis of the skin. Their number is increased in keloid and hypertrophic scars. In normal wound closures they are few in number and not activated state.

MAST CELLS

- are found throughout the body
- contain granules with a variety of chemicals
- play important immune, allergy and infection fighting functions
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FB = fiber Blast (make collagen)

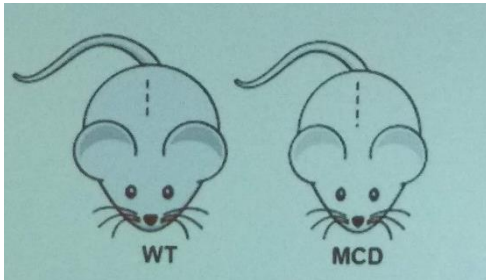
Mast cells communicate with FB

Experimental Goals:

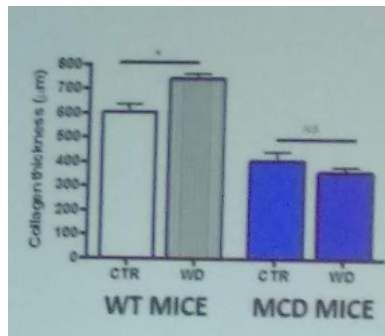
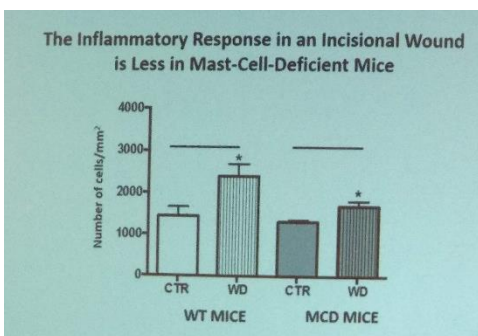
1. Evaluate the contribution of skin mast cells to incisional wound healing/scar formation
2. Are mast cells a therapeutic target for preventing abnormal scarring (hypertrophic) scarring?
3. Is this relevant to CGN?

1. Evaluate the contribution of skin mast cells to incisional wound healing/scar formation
 Experimental Protocol: MOUSE INCISIONAL WOUND MODEL

If you take the mast cells out does the wound close or have less collagen?



WT= wild type mouse, lacking pigment and with mast cells
 MCD = mouse with mast cell deficiency

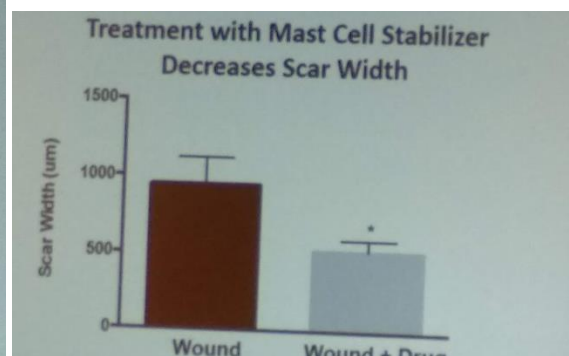
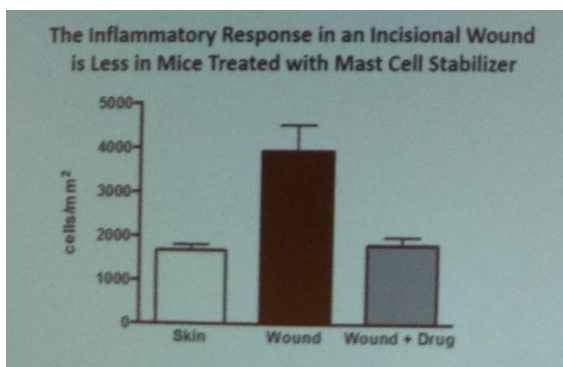


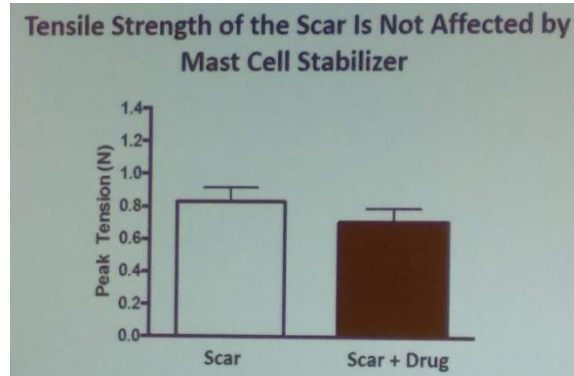
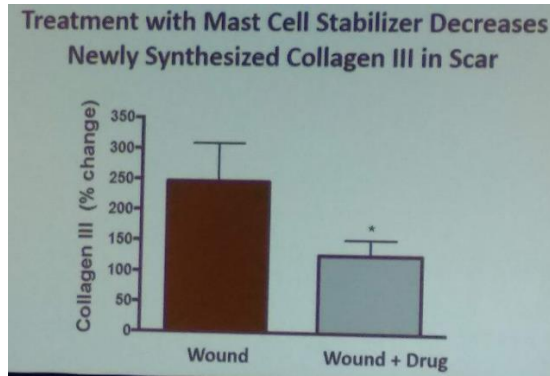
vertical: collagen thickness

2. Are mast cells a therapeutic target for preventing abnormal scarring (hypertrophic) scarring?

II. Experimental Protocol: MOUSE INCISIONAL WOUND
Treatment with a Mast Cell Stabilizer
 Silk Suture Coated with a Mast Cell Stabilizer – Local Delivery

The diagram shows a mouse with a wound, a blue drug-coated silk suture, and the chemical structure of the mast cell stabilizer. The chemical structure is a complex heterocyclic molecule with a piperazine ring and a methyl group.





(tensile strength = 'treksterkte')

Mouse Experiments Summary:

- Mast Cells Contribute to Inflammation in Wound Healing
- Mast Cells Contribute to the Synthesis of Collagen in Scar Tissue Resulting from an Incisional Wound
- Pharmacologically Arrested Mast Cell Activity Reduces Scar Collages Content w / o Compromising Scar Strength

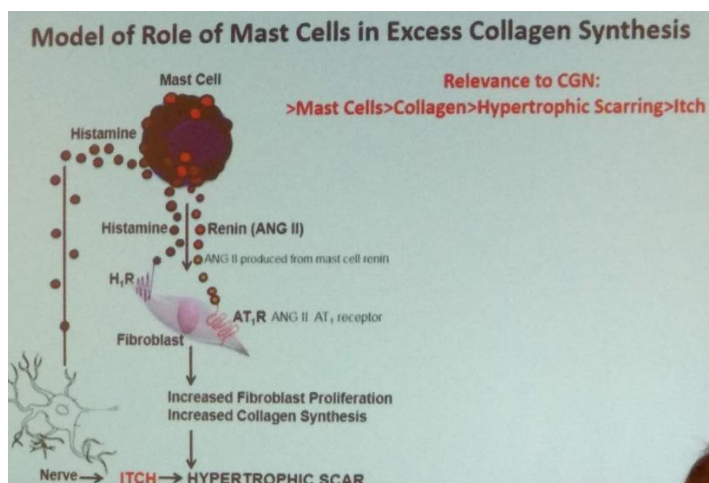
3. Is this relevant to CGN?

Slide showing increased number of mast cells in L/G CMN in pathology

- Molecular analysis revealed wildtype KIT (CD 117) for all cases
- Mast cells exhibit a mature immunophenotype with co-expression of tryptase and CD117 (KIT).

Altogether, the findings are consistent with a reactive state of mast cell hyperplasia

- Mast Cells Play a Key Role in Excessive Collagen Synthesis and Deposition in Scar Formation
- Inhibiting Mast Cell Degranulation Prevents a Fibrotic Scar Phenotype
- Mast-Cell-Deficiency and Local Delivery of a Mast Cell Stabilizer Reduces Newly Synthesized Collages in Scar Formed from an Incisional Wound
- Normal Wound Healing and Scar Formation Occur in the Absence of Mast Cell Involvement



An interesting theory to this presentation was made by Kathy Stewart, mother of a nevus owner and suffering herself from Mast Cell Activation Disorder/Syndrome.