بسم الله الرحمن الرحيم

أهمية مشتقات الإبل في صحة الأنسان

Uncovering Novel Compositions Derived from Camels and Health Benefits

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Outlines

- Medicinal uses of camel milk, camel urine, and Combinations
- Products Inspired/Derived from Bioactive Compounds in Camel Urine/camel Milk
- What are the Evidences?

  -Anti-Proliferative, Anti-Inflammatory, Anti-Angiogenesis, Anti-Thrombotic, Anti-sickling,..
- Summary & Conclusions

- **قال تعالي: (أفلا ينظرون إلى الإبل كيف حلقت)** صورة الغاشية

“Do they not look at the camels, how they are created?”

عن أنس ان رهطاً من المدينة قدموا على النبي صلى الله عليه وسلم فقالوا: إنا اجتوينا المدينة فعظمت بطوننا وإرتهشت أعضادنا فأمرهم النبي صلى الله عليه وسلم أن يلحقوا براعي الإبل فيشربوا من ألبانها وأبوالها حتى صلحت بطونهم وألوانهم.

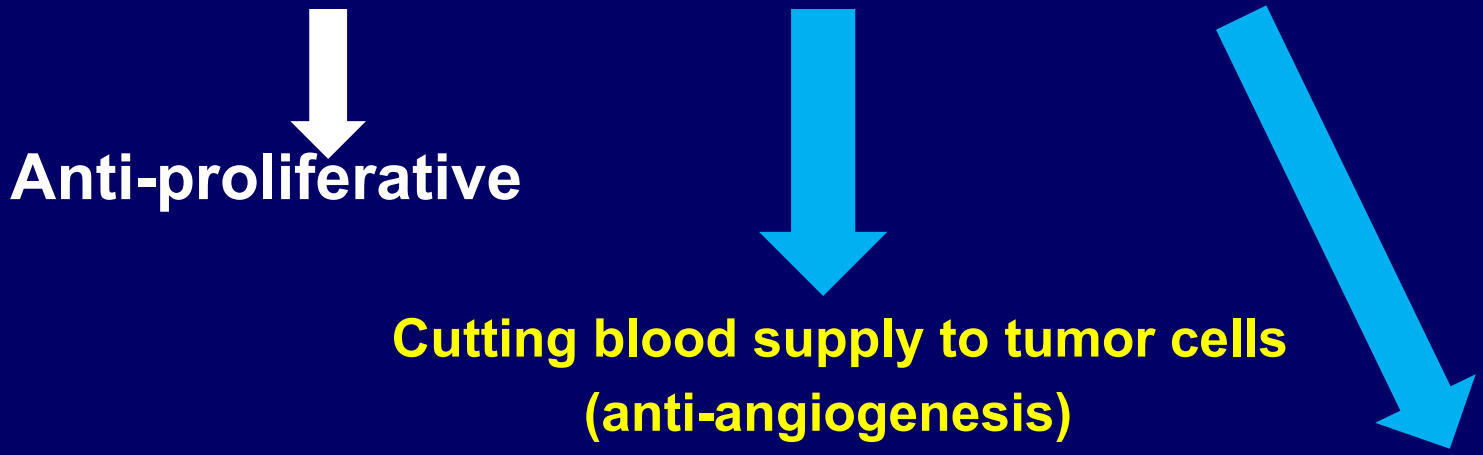
رواه البخاري

Medicinal uses of camel milk & urine

- Anti-cancer
- Antithrombotic without systemic anticoagulation
- Pathological Angiogenesis (DR, AMD,..)
- Anti-Sickling / Antiadhesive in Sickle Cell

Medicinal uses of camel Urine/Milk – cont.

Drug actions against cancer



International Journal of Cancer Research 2 (4): 330-344, 2006
ISSN 1811-9727

In vitro Anticancer Agent
I-Tissue Culture Study of Human Lung Cancer Cells A549
II-Tissue Culture Study of Mice Leukemia Cells L1210

[1]F.A. Khorsid and [2]S.S. Mushref

healthy tissue and the function of the vital organs'. Tissue culture of human lung cancer cells and mice leukemia cells were compared with that of normal (human skin fibroblasts) in studying the effect of PM 701. This agent proved to induce apoptosis of the cancer cells without detrimental effect on normal cells; through its effect on the nuclei, limiting the division of cells, causing degeneration in apoptotic manner. PM 701 exhibited nourishing

Faten A. Khorshid

Findings: 2009

- **PMF (extract of PM 701: Sterile natural product) and its sub-fractions:**

- **Variable and notably high cytotoxic activity against the tested cell lines:**

  hepatocellular carcinoma (HEPG2),

  colon carcinoma (HCT 116) and

  human glioma (U251) cells.

  Lung cancer cells

  Leukemic cells


18 9:40AM

Journal of Alternative and Complementary Medicine, 2010

The anti-platelet activity of camel urine

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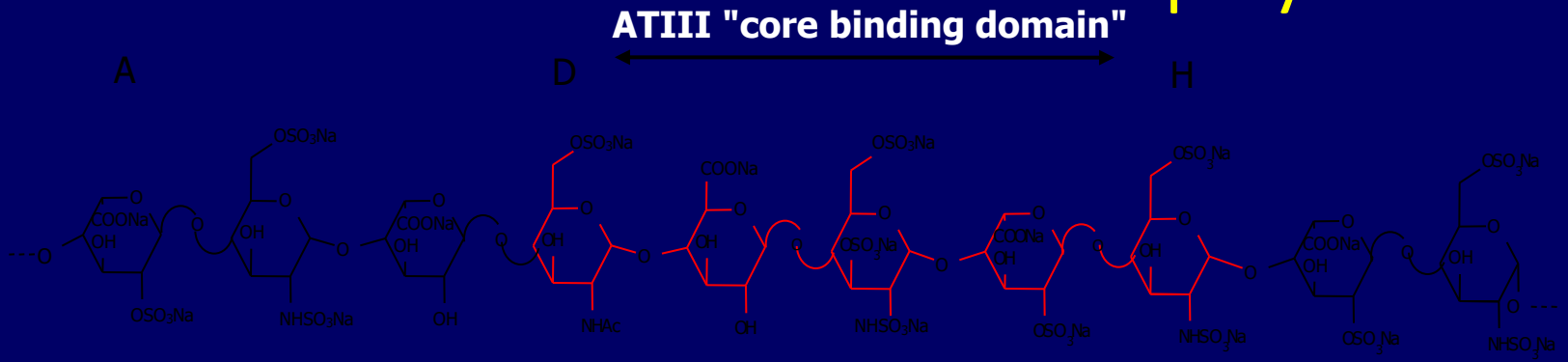
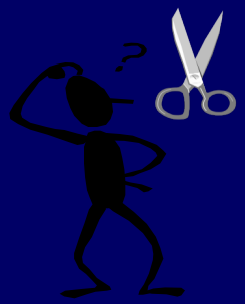
2 The Pharmaceutical Research Institute at Albany College of Pharmacy and Health Sciences, One Discovery Drive, Rensselaer, NY, 12144, USA

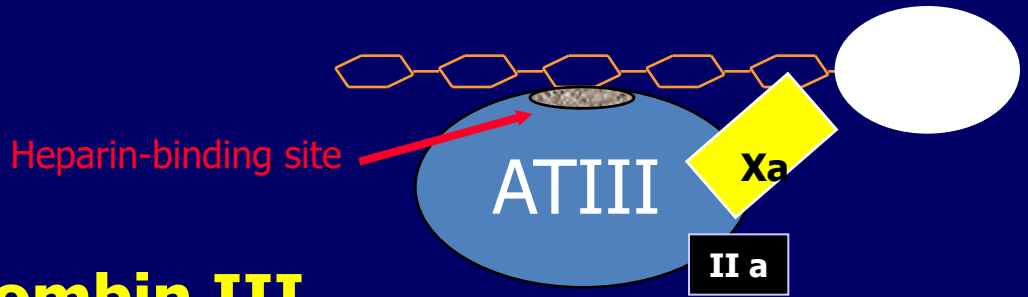
Alhaidar A, Abdel Gader AG, Mousa SA. **The antiplatelet activity of camel urine.** *J. Altern Complement Med. 2011 Sep;17(9):803-8.*

Heparin Depolymerization Processes in LMWH Preparations

- How is the endogenous heparin chain depolymerized?



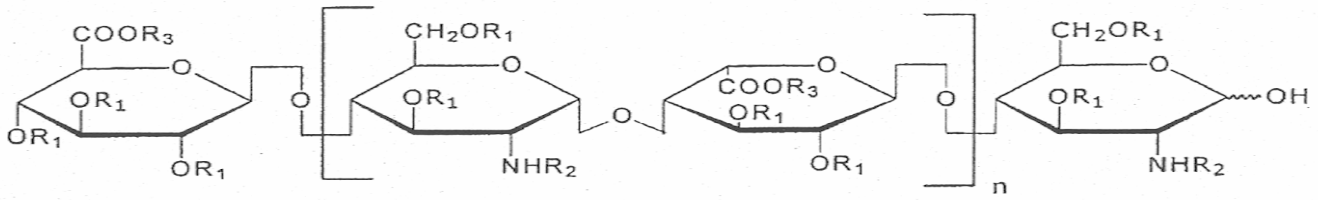




ATIII = antithrombin III

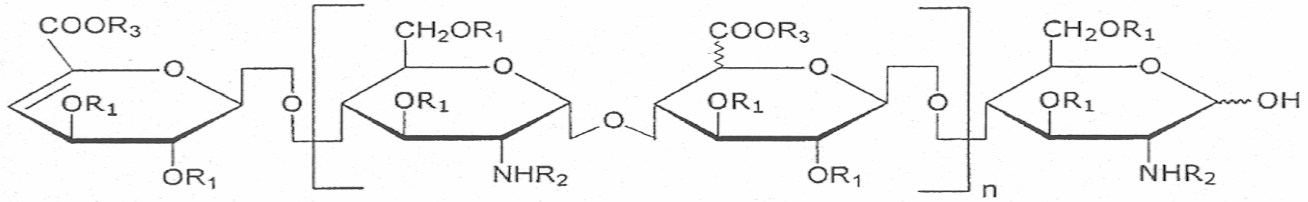
Pentasaccharide is the smallest sequence that has affinity for ATIII

A. Unfractionated heparin:



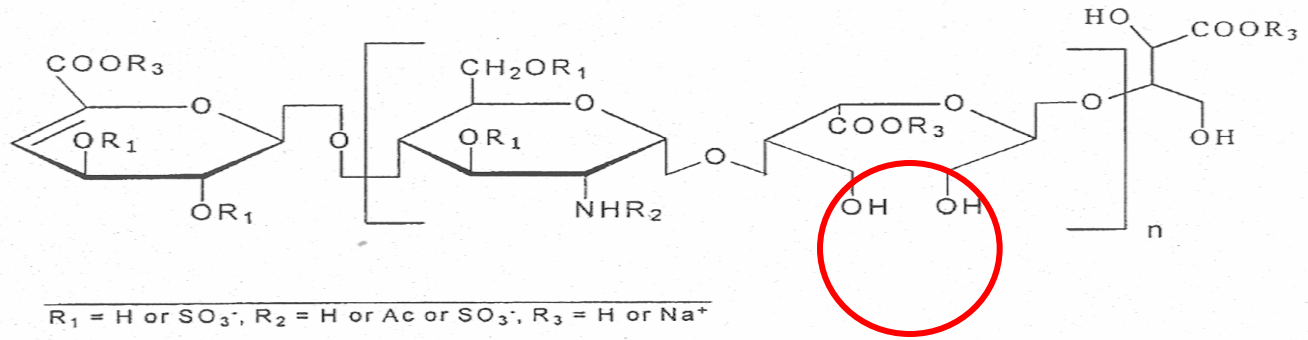
n = 20 - 35, R_1 = H or SO_3^-, R_2 = H or Ac or SO_3^-, R_3 = H or Na^+

B. Tinzaparin: LMWHS



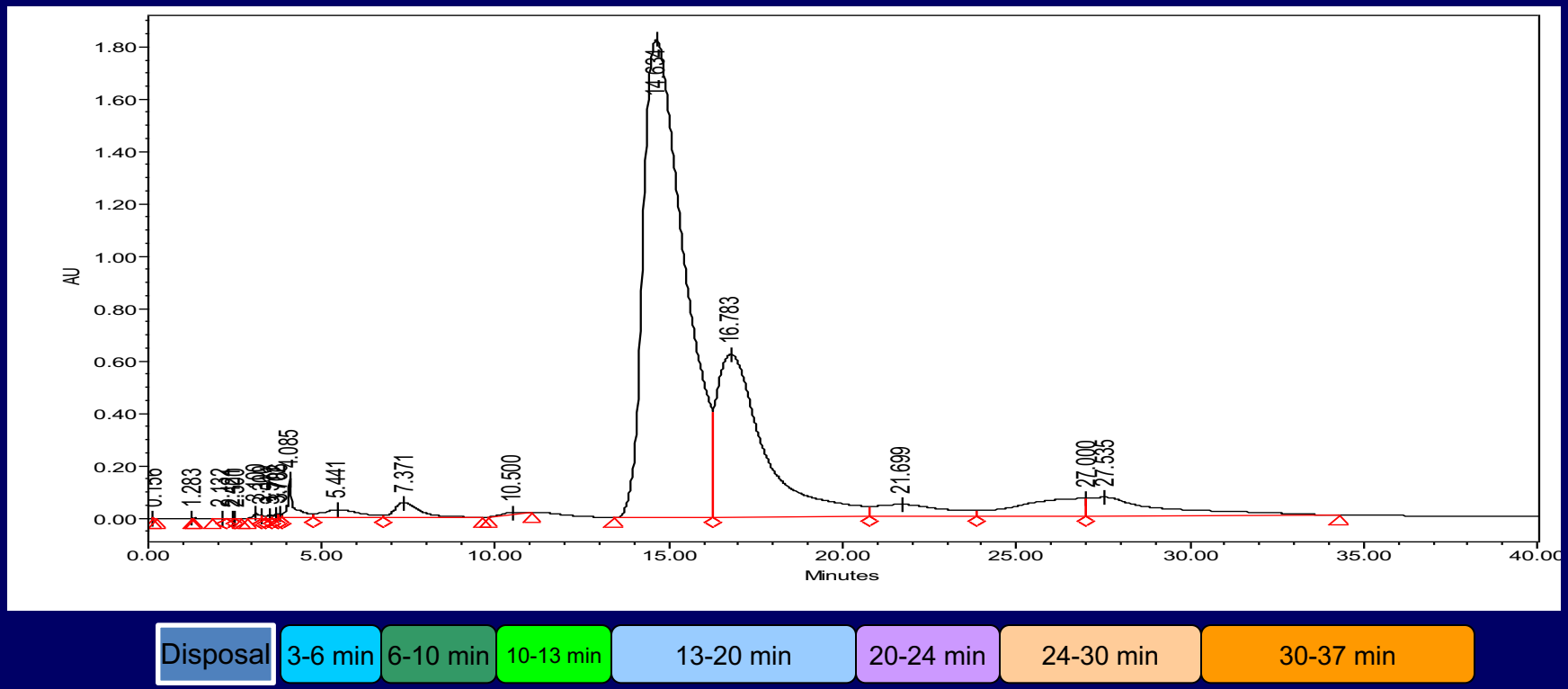
n = 4 - 10, R_1 = H or SO_3^-, R_2 = H or Ac or SO_3^-, R_3 = H or Na^+

C. NAC heparin:



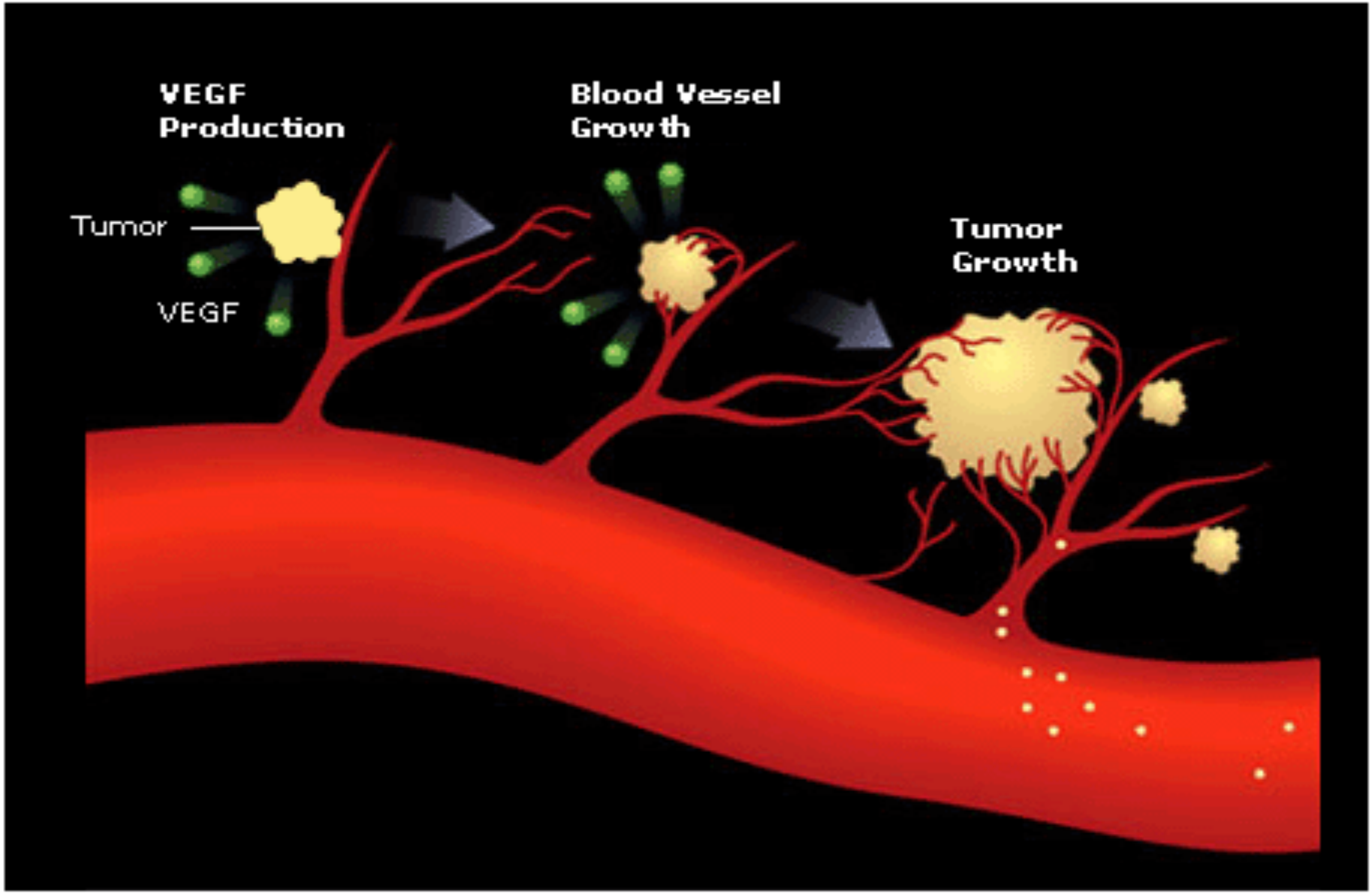
R_1 = H or SO_3^-, R_2 = H or Ac or SO_3^-, R_3 = H or Na^+

Figure 1. Chemical structure. Molecular structure of: (A), unfractionated heparin; (B), Tinzaparin; and (C), NAC heparin.

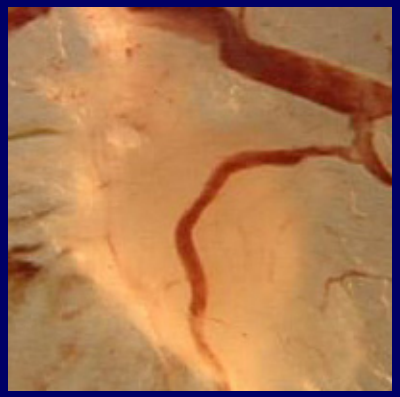


Time-schedule for camel urine fraction collection (Fractions 1-7). An aliquot of 30 µl camel urine was injected onto a normal (NH3) HPLC column and eluted with 95% acetonitrile at 1 ml/min. The fractions were collected on the time-schedule. The fractions at same time period from three injection (90 µl of urine in total) were pooled and dried by lyophilization.

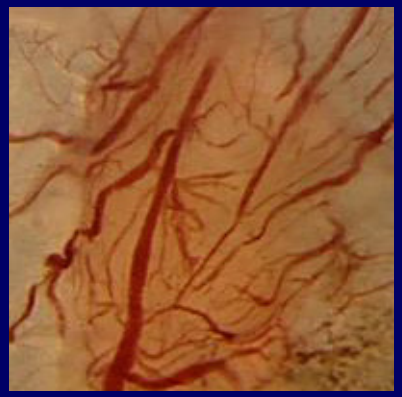
Angiogenesis



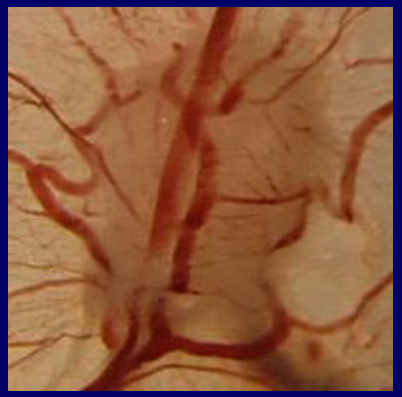
Representative illustration for the effect of HPLC-SEC separated camel urine fractions (1-7) versus LMWH on human chemo-resistant breast cancer cells (MCF7-Doxorubicin resistant) tumor angiogenesis in the CAM model



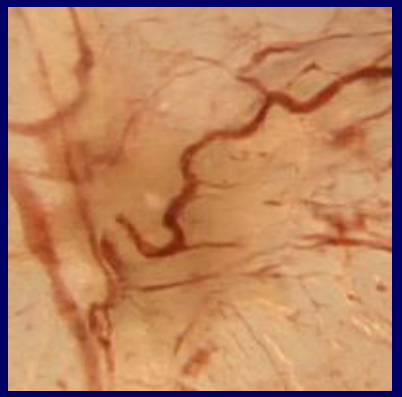
control



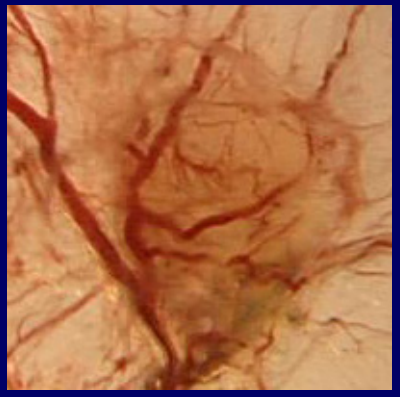
Breast cancer



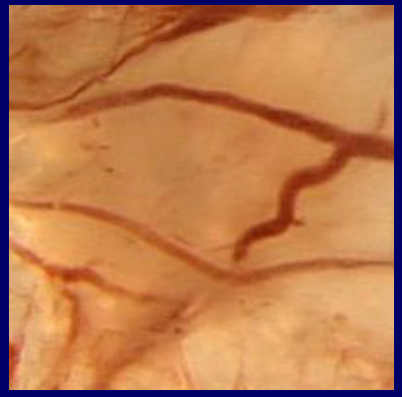
Fraction 2



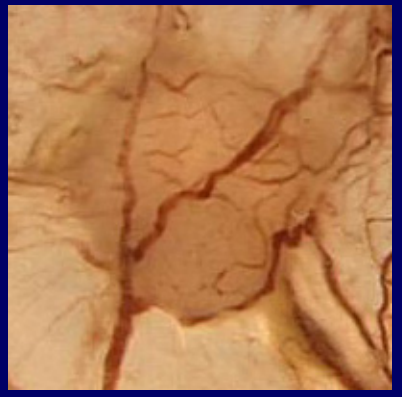
Fraction 4



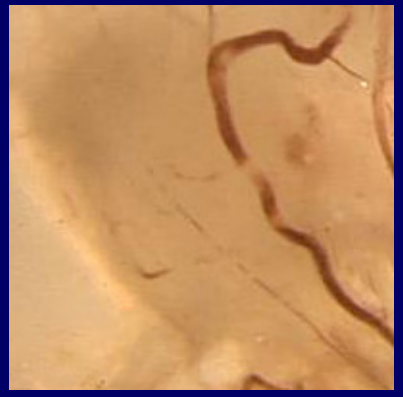
Fraction 5



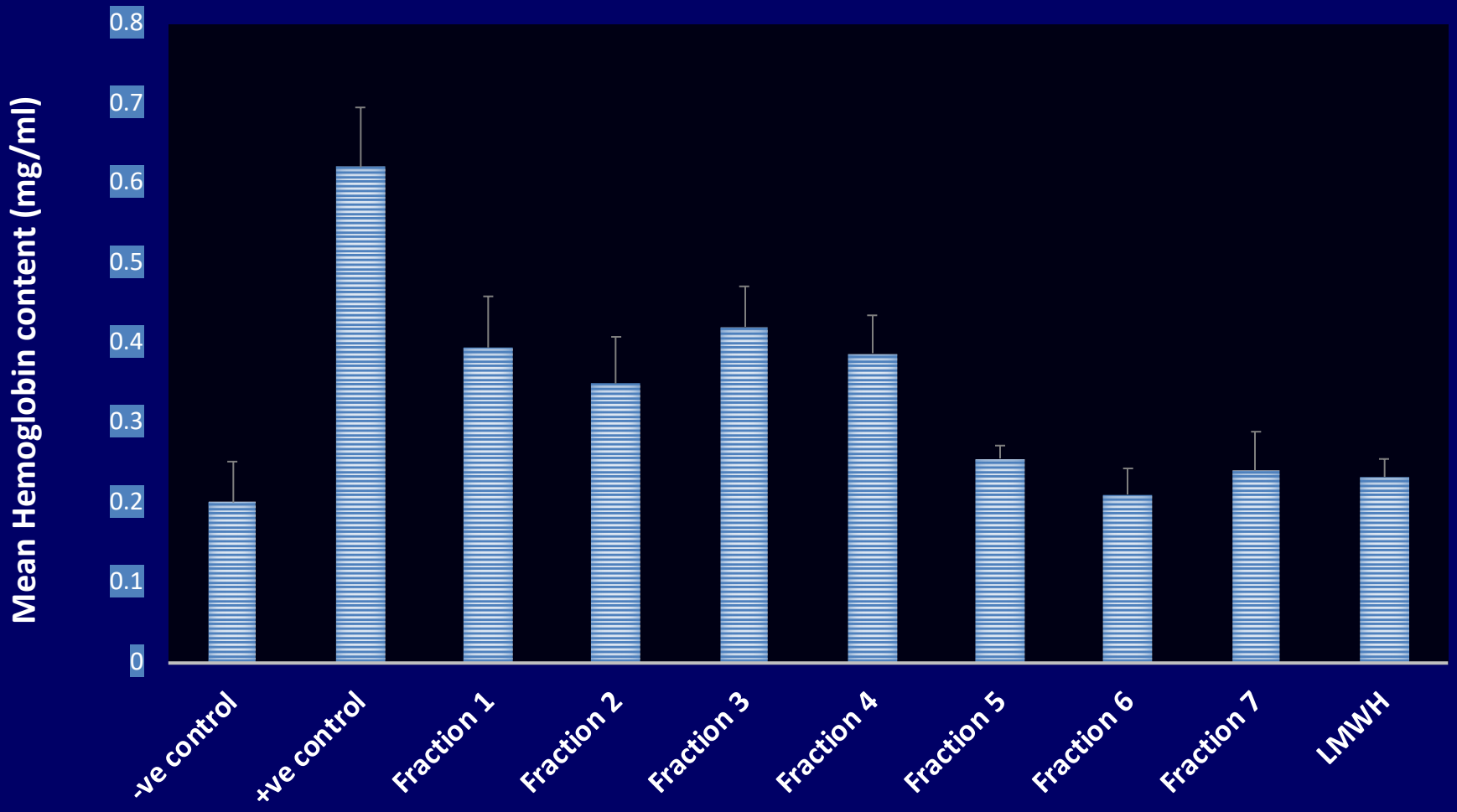
Fraction 6



Fraction 7

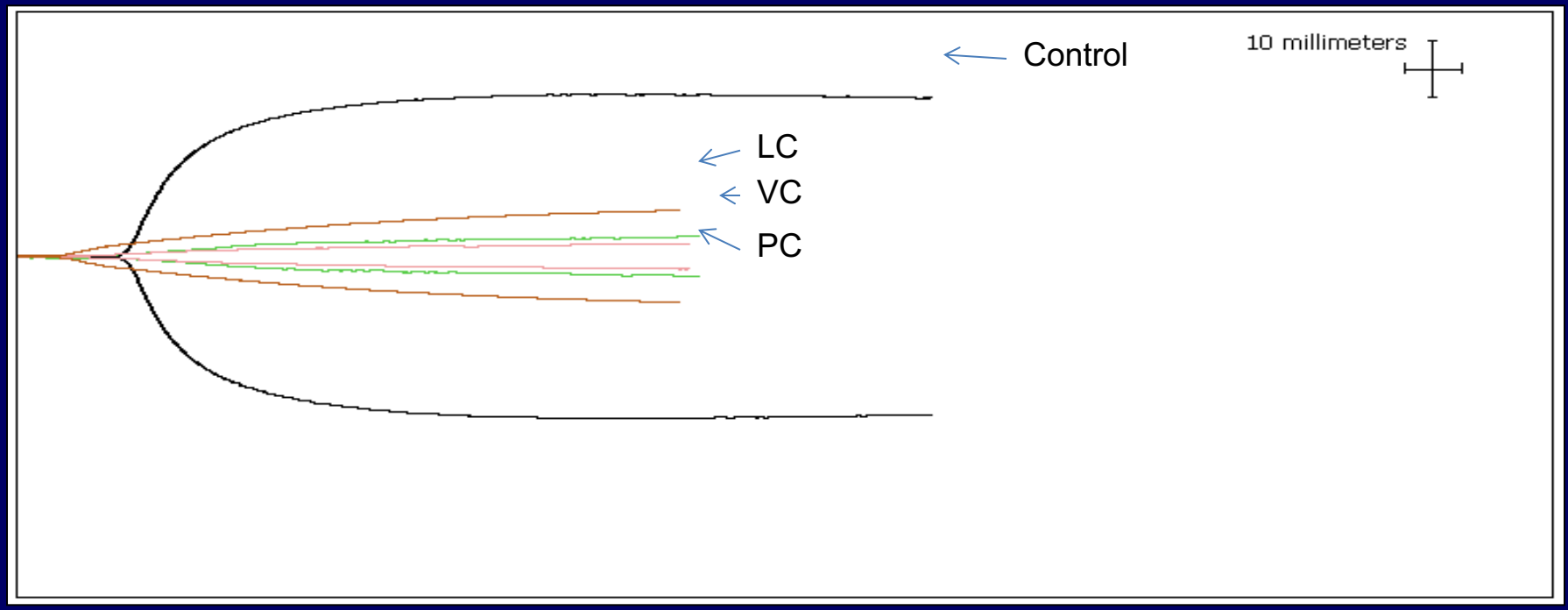


LMWH



Effect of HPLC-SEC separated camel urine fractions (1-7) on human chemo-resistant breast cancer cells (MCF7-Doxorubicin resistant) tumor angiogenesis in the CAM model

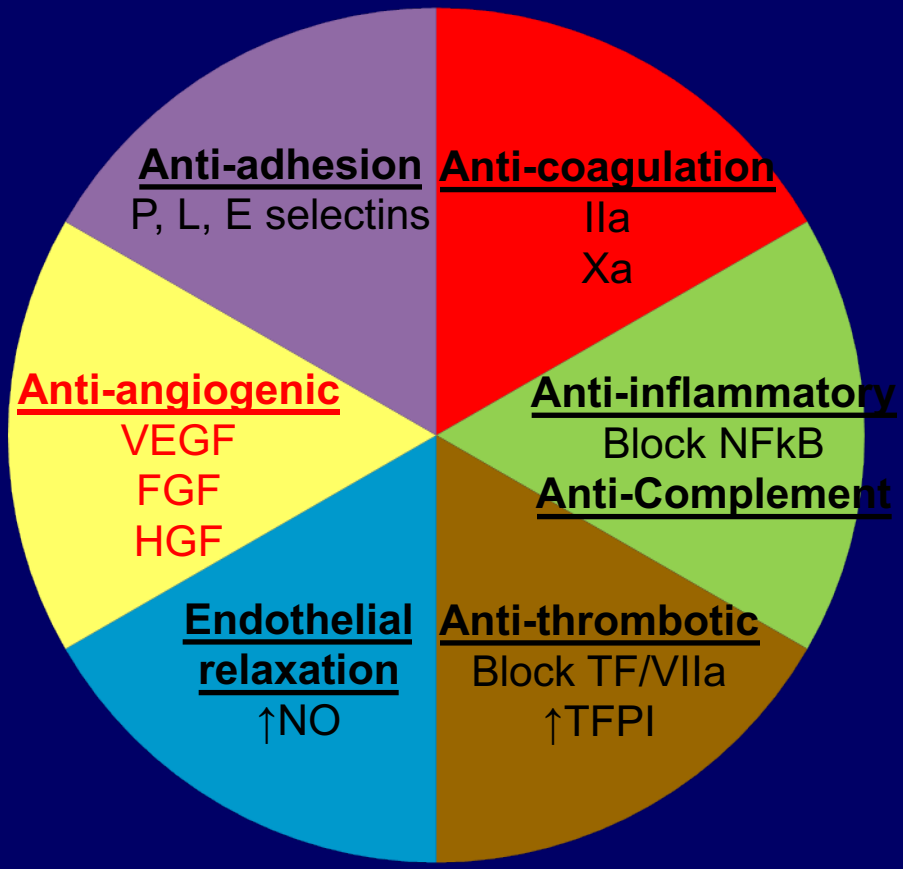
Effect of Camel Urine Fractions on human Clot Kinetic Using TEG

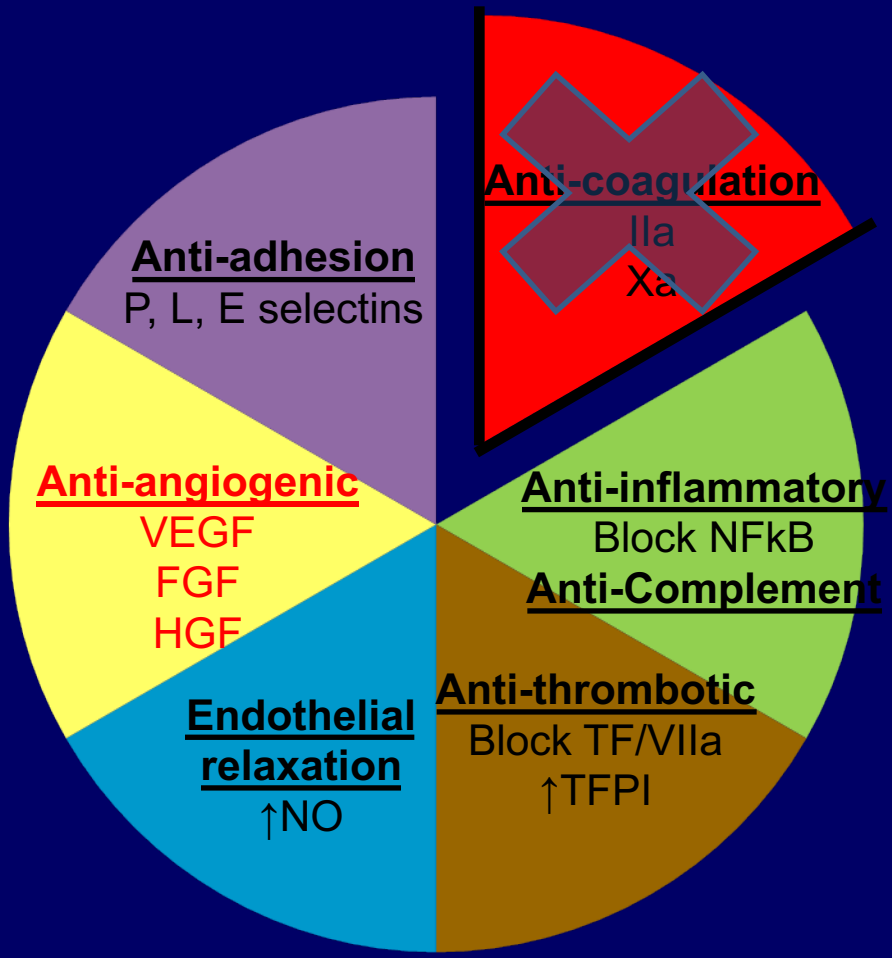


	R	MA	angle
Control	9.6	55.4	59.1
Lactating Camel (LC)	14.7	4.8	2.9
Virgin Camel (VC)	16.1	2.4	2.1
Pregnant Camel (PC)	5.8	10.7	12.5

Illustrate the anti-coagulant activity of GAGs camel bio products in various camel urine

Multiple Pathways Targeted by UFH/LMWH and S-NACH





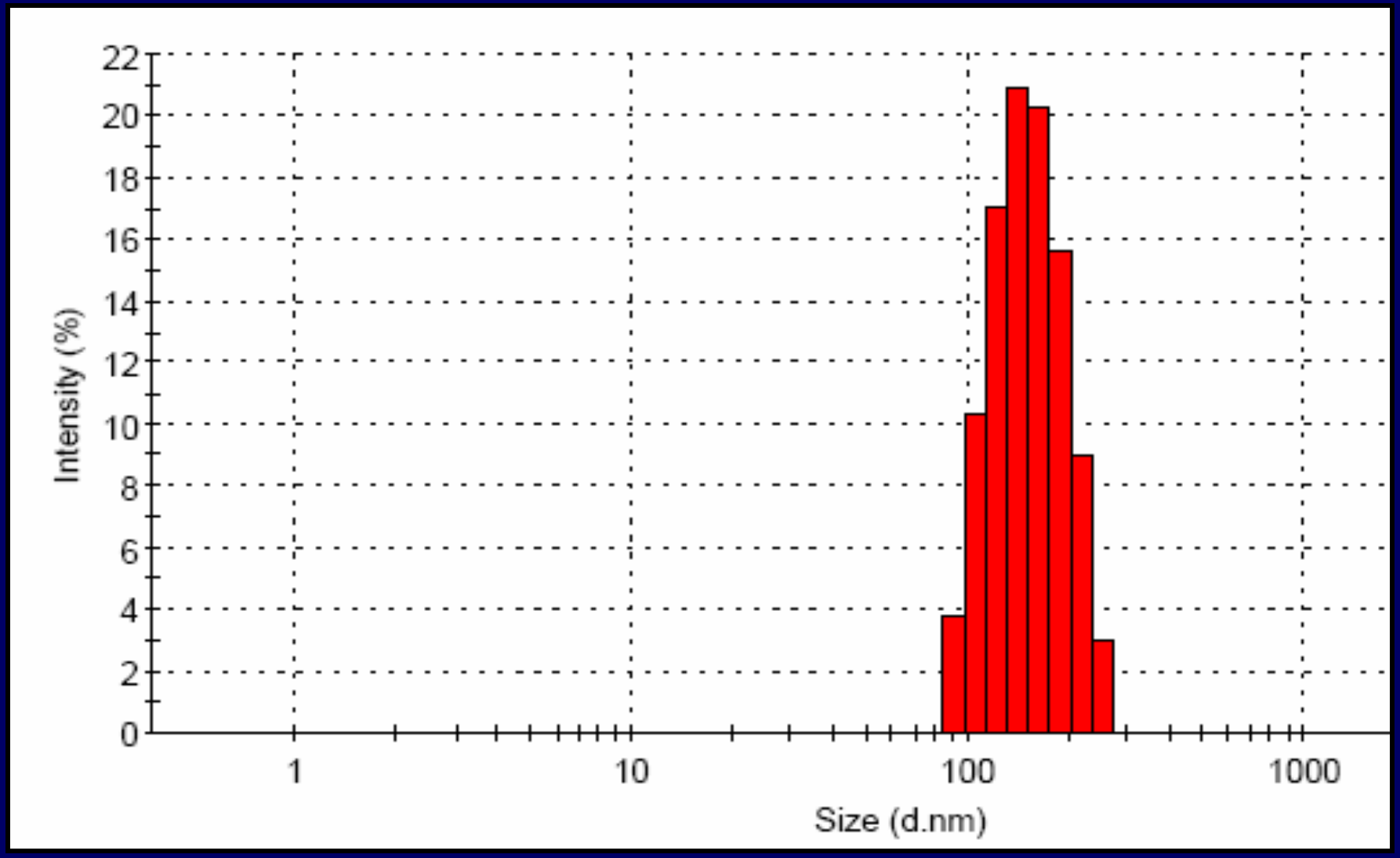
UFH/LMWH

Plasmatic + vascular activity

Camel Lung, Liver, GI

S-NACH (Vascular affinity)

Camel Urine



DLS data showing the size distribution of Camel Lactoferrin nanoparticles encapsulating the camel derived GAG: NACHs, chondroitin / dermatan sulfate (average size~150nm).

References US Patents

- *Mousa; SA* Al Haider; A, Abdelgader; A, Aldahmash; A, Almomen; A: Methods and compositions of camel derived products. *US Patent 9,770,419; September 26, 2017*.

- Mousa, SA: Composition and method for sulfated non-anticoagulant low molecular weight heparins in cancer and tumor metastasis. *US Patent 9,572,831; February 21, 2017.*

- Mousa SA: Composition and method of use for combinations of anti-viral protease, polymerase inhibitors and natural bioactive compounds in the treatment of hepatitis C infection. *US Patent 10,046,005, August 14, 2018.*

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Mousa SA: Compositions and method for anti-sickling of red blood cells in sickle cell disease. ***US Patent 9,822,190, November 2017***

Mousa SA: Method and composition of glycosaminoglycan in sickle cell and vascular disorders. ***US Patent 9,480,703; November 2016.***

Mousa SA: Ocular Nanoformulation and method of use in angiogenesis-mediated disorders. **US Patent 9,655,862; May 2017**.

Mousa SA: Composition and method for sulfated non-anticoagulant low molecular weight heparins in cancer and tumor metastasis. ***US Patent 9,572,831; Feb 2017.***

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tusind tak
谢谢
dakujem vám
ありがとう
ngiyabonga
dziękuję
merci
suksema
danke
thank
you
baie dankie
धन्यवाद
molte grazie
gracias
obrigada
takk
obrigado
gràcies
dank u
teşekkür ederim
شكرا
tänan
tack så mycket
teşəkkür edirə
mahalo