# Platelet Aggregation Suppression by Glucosame Supplement

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### **GLUCOSAMINE SUPPRESSES PLATELET AGGREGATION**

A healthy 47-year old Hispanic  $\mathcal{Q}$  has donated blood for several years to provide normal platelet aggregometry controls in our facility for aspirin response studies

Her aggregation results were consistent

She reported taking no NSAIDS or other medications or supplements that would affect platelet function

On two consecutive donations one month apart the platelet aggregation results were suppressed

She reported she had begun a daily dose of 1500 mg of glucosamine with 1500 mg celadrin ~4 weeks prior to the first suppressed aggregation result

A literature search generated one article that demonstrated glucosamine suppressed human platelet ADP receptors, but not collagen or thrombin receptors

•Two additional articles using guinea pigs and dogs also showed the effect of glucosamine on platelet function

### MATERIALS AND METHODS

Both light transmittance (LTA) and whole blood impedance platelet aggregometry (WBA) were performed using a Chrono-Log 570 VS

- Agonists: ADP, collagen, arachidonic acid (AA)

PFA-100 studies were performed using ADP/collagen (CADP) and EPI/collagen (CEPI) cartridges

• The Accumetrics system and specific VerifyNow cartridges were used to detect aspirin and Plavix response

Complete blood counts including platelet counts were performed on an ADVIA 120 hematology analyzer

All platelet function testing employed 3.2% citrated whole blood

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Normal controls: Baselines before enrolling in 81 mg ASA protocol

Normal controls: Baselines before enrolling in 325 mg ASA protoco

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Subject has been taking a glucosamine/celadrin since 6/11/2008 (30 days). Platelet aggregations are suppres

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Subject has been taking glucosamine/celadrin two months All aggregations are suppressed

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ubject has not taken glucosamine/celadrin supplement for 14 da	ys.
ggregations have normalized.	

Date of Platelet Aggregometry	20 µM ADP LTA	10 μM ADP WBA	5 µM ADP WBA	1.0 μg Collagen WBA	0.5ηM AA WBA
02.16.05		9Ω	30	25 <b>Ω</b>	19 <b>Ω</b>
07.10.08	51%	0Ω	0 <b>Ω</b>		
08.08.08	43%	0Ω	5Ω		
09.23.08	79%	8	1Ω		
Normal	> 60%	> 8Ω	> 5	> 8Ω	> 8Ω
Date of Platelet Assa	PFA CAPD	PFA CEPI	Accumetrics A	SA Accumetr	ics P2Y <sub>1</sub>
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Date of Platelet Assa 07.10.08 08.08.08	PFA CAPD 112 sec 129 sec	PFA CEPI 148 sec 108 sec	Accumetrics A 660 ARU 662 ARU	SA Accumetr	<mark>ics P2Y<sub>1</sub></mark> % %
Date of Platelet Assay 07.10.08 08.08.08 09.23.08	PFA CAPD 112 sec 129 sec 76 sec	PFA CEPI 148 sec 108 sec 138 sec	Accumetrics A 660 ARU 662 ARU 610 ARU	SA Accumetr 30 13 4	<mark>iics P2Y</mark> 1 % % %
Date of Platelet Assay 07.10.08 08.08.08 09.23.08 Normal	PFA CAPD 112 sec 129 sec 76 sec < 145 sec	PFA CEPI 148 sec 108 sec 138 sec < 175 sec	Accumetrics A 660 ARU 662 ARU 610 ARU < 550 ARU	SA Accumetr 34 13 44 <<2	<mark>ics P2Y</mark> % % % 0%

- platelet aggregations returned to normal limits
- by the supplement

· A single assay may not give investigators enough information to analyze abnormal platelet function The supplement suppressed ADP-induced platelet aggregation

• A population study may help establish risk for glucosamine supplements in individuals taking anti-platelet function drugs such as Plavix or aspirin

Hua J, Suguro S, Yuko I, Iwabuchi K, Nagaoka I. Inhibitory actions of glucosamine on platelet functions. Inflammation and Regeneration 2003;164-

Lu-Suguro JF, Hua J, Sakamoto K, Nagaoka I. Inhibitory action of glucosamine on platelet activation in guinea pigs. Inflammation Research 2005;493–99. Bertram J, Ragatz BH, Baldwin W, latrides PG. The effects of glucosamine on platelet aggregation. Thrombosis Research 1981;301-7.



## DISCUSSION

• The subject discontinued glucosamine/celadrin and the • The ADP LTA alone, but all WBA curves were suppressed

PFA-100 closure times were all within normal limits • The Accumetrics P2Y12 cartridge results, which are specific for that ADP receptor, were all within normal limits

## REFERENCES