

## Platelet Aggregation Suppression by Glucosamine Supplement

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## Glucosamine Suppresses Platelet Aggregation

- A healthy 47-year old Hispanic ♀ 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

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## Glucosamine Suppresses Platelet Aggregation

- 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

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## 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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## Results

Date of Platelet Aggregometry	20 µM ADP LTA	10 µM ADP WBA	5 µM ADP WBA	1.0 µg Collagen WBA	0.5µM AA WBA
02.16.05		9Ω	30Ω	25Ω	19Ω
07.10.08	51%	0Ω	0Ω		
08.08.08	43%	0Ω	5Ω		
09.23.08	79%	8Ω	1Ω		
Normal	> 60%	> 8Ω	> 5Ω	> 8Ω	> 8Ω

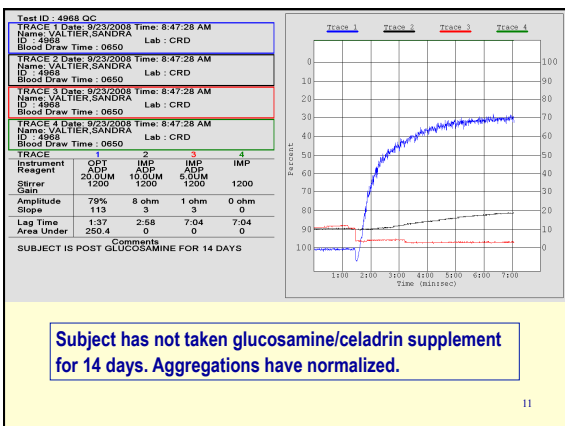
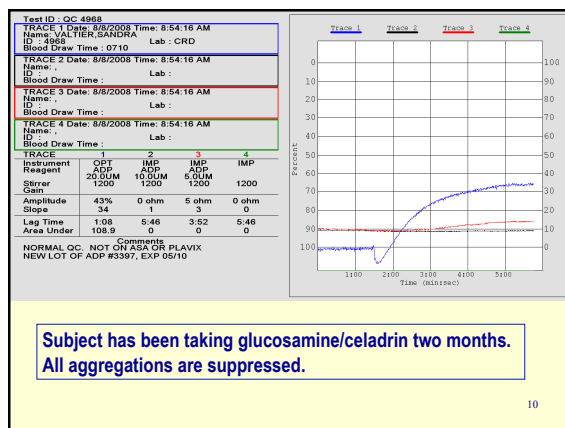
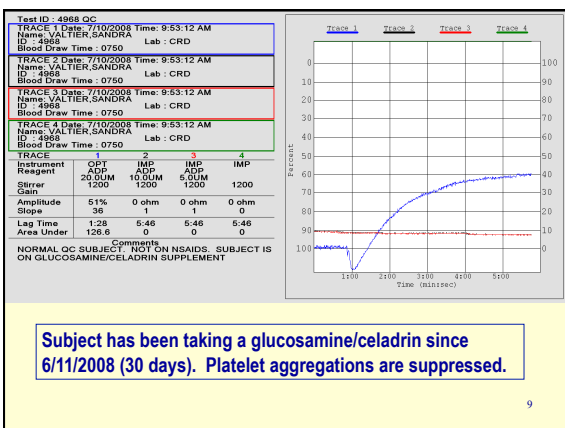
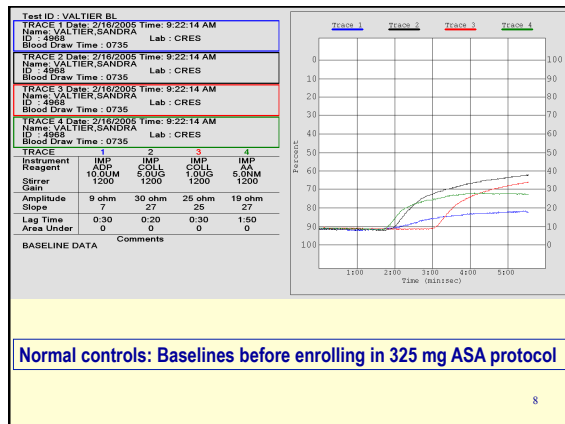
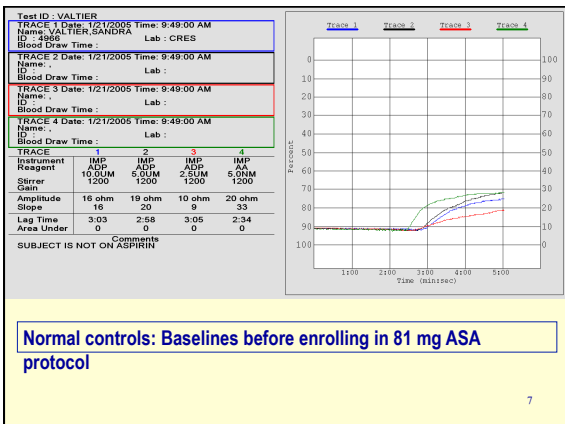
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## Results

Date of Platelet Assay	PFA CAPD	PFA CEPI	Accumetrics ASA	Accumetrics P2Y <sub>12</sub>
07.10.08	112 sec	148 sec	660 ARU	3%
08.08.08	129 sec	108 sec	662 ARU	13%
09.23.08	76 sec	138 sec	610 ARU	4%
Normal	< 145 sec	< 175 sec	< 550 ARU	< 20%

ARU = aspirin resistance units

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**Discussion**

- The subject discontinued glucosamine/celadrin and the platelet aggregations returned to normal limits
- The ADP LTA alone, but all WBA curves were suppressed by the supplement
- PFA-100 closure times were all within normal limits
- The Accumetrics P2Y<sub>12</sub> cartridge results, which are specific for that ADP receptor, were all within normal limits

## Discussion

- 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

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## References

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