von Willebrand Factor Collagen Binding (III and IV)

Versiti offers two individual Collagen Binding Assays as well as one Collagen binding Profile to aid in the diagnosis of von Willebrand Disease.

Von Willebrand disease (VWD) is common bleeding disorder is attributed to deficient von Willebrand factor (VWF) function. VWF is a multifaceted protein, which functions to support adhesion of platelets at sites of vascular injury and as a transporter of coagulation factor VIII in blood plasma. Von Willebrand disease is classified as either mild to moderate quantitative deficiency (type 1), qualitative defects (types 2A, 2B, 2M and 2N) or as severe quantitative deficiency with virtual absence of VWF (type 3).[1,2] Correct classification of VWD subtype is essential for providing effective treatment and counseling. Initial diagnostic testing of a patient for suspicion of VWD includes Factor VIII activity, VWF antigen levels, and VWF platelet binding activity. In a patient with bleeding symptoms, abnormality of one of these screenings may indicate that supplemental assays are indicated in order to appropriately classify a patient's von Willebrand disease diagnosis. The von Willebrand Diagnostic Evaluation (order code 1800) offers a reflexive algorithm that efficiently provides such diagnostic testing.

In vivo, collagen binding by VWF facilitates platelet adhesion at sites of blood vessel injury. The collagen binding assay is a supplemental functional assay that specifically evaluates the ability of a patient's VWF to support platelet adhesion. Defects in collagen binding may arise either due to deficiency of VWF (type 1 and 3 VWD), absence of the larger multimeric forms of VWF in plasma (as occurs with types 2A, 2B and platelet-type VWD), or due to point mutations that specifically alter the domains of VWF that sub serve collagen binding (as occurs in a subset of individuals with type 2M VWD). The collagen binding panel was designed to identify rare individuals with isolated defects in the A3 domain that binds types I and III collagen, and even rarer individuals with defects in the A1 domain that binds types IV and VI collagen. Interpretation of VWF collagen binding assay is facilitated by comparing the VWF collagen binding result with the VWF antigen result run of the same plasma sample. Discrepancy between Collagen III Binding (VWF:CB3) and VWF antigen levels is a sensitive screen for deficiency of large VWF multimers, but if multimer distribution is normal, could indicate type 2M VWD due to defect in the A3 domain. Similarly, discrepancy between Collagen IV Binding (VWF:CB4) and VWF antigen levels in the absence of a multimer defect could indicate type 2M VWD due to defect in the A1 domain.

Indications for testing:

VWF Collagen III Binding and/or VWF Collagen IV Binding:

- Supplemental study where the result will be correlated and interpreted considering a locally determined VWF antigen result. (Note that Versiti lab reference intervals for VWF:CB3/VWF:Ag and VWF:CB4/VWF:Ag may not be fully translated if the VWF:Ag is determined locally).

VWF Collagen Binding Profile (including VWF:Ag, VWF:CB3 and VWF:CB4 with reflex to VWF Quantitative Multimer, if indicated):

- Supplemental investigation of a patient with a hemorrhagic disorder in whom initial studies do not fully explain the bleeding phenotype, and evaluation for rare forms of type 2M VWD merit investigation.

Test method:

ELISA

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Assay sensitivity and limitations:

Defects in binding to collagen types not included in this assay will not be detected.[2]

Specimen requirements:

0.5 ml citrated plasma aliquot, frozen in a plastic tube

SHIP

Shipping requirements:

Place the frozen specimen and the requisition into plastic bags, seal and place in an insulated container. Surround with at least 5 pounds of dry ice. Seal the insulated container, place into a sturdy cardboard box, and tape securely. Ship the package in compliance with your overnight carrier guidelines. Label with the following address:

Send to:
Versiti Client Services
Diagnostic Laboratories
638 N. 18th Street
Milwaukee, WI 53233

ORDER

Required forms:

Please complete all pages of the requisition form, including patient history on page 2 for optimal results interpretation.

CPT Codes/Billing/Turnaround time:

Order Code:

VWF Collagen III Binding: 1281
VWF Collagen IV Binding: 1280
VWF Collagen Binding Profile: 1279

Visit Versiti.org for suggested CPT codes.

Turnaround Time:

VWF Collagen III Binding: 10 days
VWF Collagen IV Binding: 10 days
VWF Collagen Binding Profile: 14 days

References

1. Goodeve A, James P. von Willebrand Disease. 2009 Jun 4 [Updated 2014 Jul 24]. In: Pagon RA, Adam MP, Ardinger HH, et al., editors. GeneReviews® [Internet]. Seattle (WA): University of Washington, Seattle; 1993-2016. Available from: http://www.ncbi. nlm.nih.gov/books/NBK7014/
2. De Jong A, Eikenboom J. Developments in the diagnostic procedures for von willebrand disease. J Thromb Haemost. 2016;14(3):449-460. Accessed June 9, 2016. doi: 10.1111/jth.13243.
3. Flood VH, Gill JC, Friedman KD, et al. Collagen binding provides a sensitive screen for variant von willebrand disease. Clin Chem. 2013;59(4):684-691. Accessed June 9, 2016. doi: 10.1373/clinchem.2012.199000.

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