

# *14-3-3eta for Rheumatoid Arthritis*

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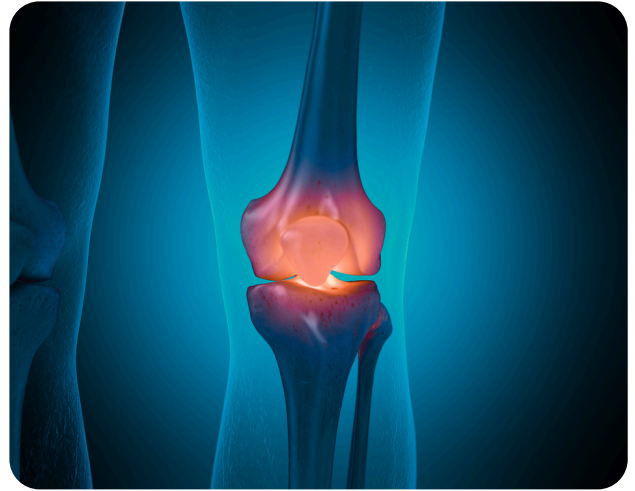
Inform precise and timely clinical decisions  
in rheumatoid arthritis management at every stage of care.



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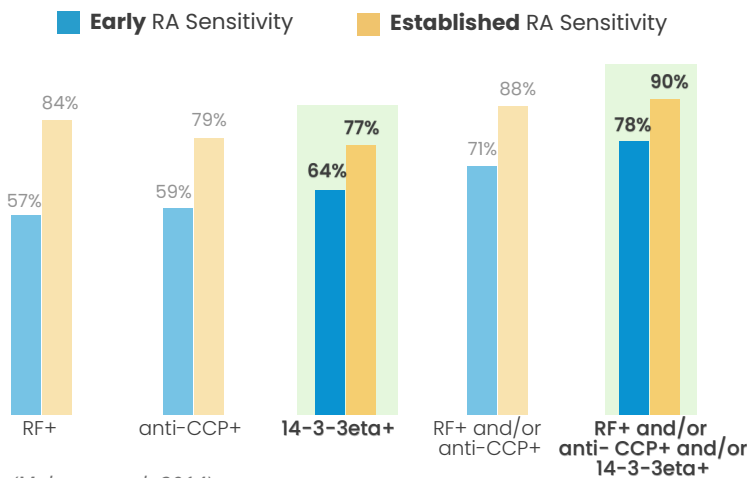
# 14-3-3eta is a joint-specific RA biomarker

The 14-3-3 $\eta$  (eta) protein is a joint-derived, proinflammatory mediator that is implicated in the joint erosion process and pathogenesis of rheumatoid arthritis (RA). (Maksymowych 2014)



- ① **Function:** 14-3-3eta is an intracellular chaperone and signal transduction protein.
- ① **Propagation of RA pathology:** During joint inflammation, 14-3-3eta is released into the synovial fluid and serum, where it acts as a pro-inflammatory ligand, driving further joint damage.
- ① **Specificity:** Elevated levels of 14-3-3eta in serum and synovial fluid are highly specific to RA, distinguishing it from other inflammatory arthritides and healthy individuals
- ① **Joint inflammation:** The presence of 14-3-3eta in serum indicates ongoing joint inflammation and damage risk.

## 14-3-3eta complements RF and anti-CCP to enable earlier, more accurate diagnosis of RA



(Maksymowych 2014)

Pooled sensitivity



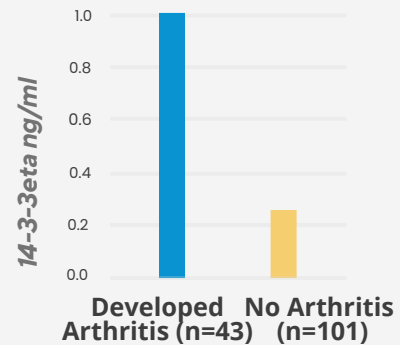
Pooled specificity



Based on a 16-report meta-analysis (Abdelhafiz, 2021)

- ① **High Sensitivity and Specificity:** 14-3-3eta is highly sensitive and specific for diagnosing early and established RA
- ① **Seronegative RA:** 14-3-3eta is valuable in detecting RA in RF/anti-CCP seronegative patients.
- ① **Complements existing markers:** When combined with RF and anti-CCP, 14-3-3eta improves diagnostic accuracy.
- ① **Predictive Value:** Elevated 14-3-3eta levels are associated with higher disease activity and flare risk.

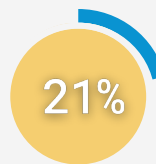
### Identify at-risk patients, years before clinical onset



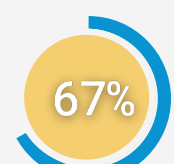
- ① 14-3-3eta is detectable prior to onset of arthritis in patients who are positive for anti-CCP and/or RF.
- ① Arthralgia patients that develop clinical arthritis have 3.4x higher levels of 14-3-3eta up to 5 years before onset.

(van Beers-Tas 2016)

### 14-3-3eta identifies patients that are RF and anti-CCP seronegative:



of patients who have **early** RA



of patients who have **established** RA

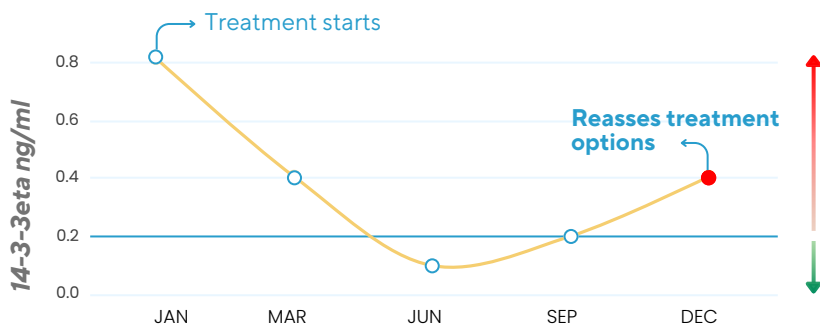
(Naidas 2015)

# Monitor response to therapy and disease severity augurex

14-3-3eta is modifiable and an independent predictor of radiographic progression. Closely monitor your patient's response to therapy by serial testing of 14-3-3eta:

Combining the modifiable 14-3-3eta and CRP markers resulted in better prediction of joint damage than either marker alone, and assists with tight-control RA treatment strategies. (*Carrier 2016; Carrier 2020*)

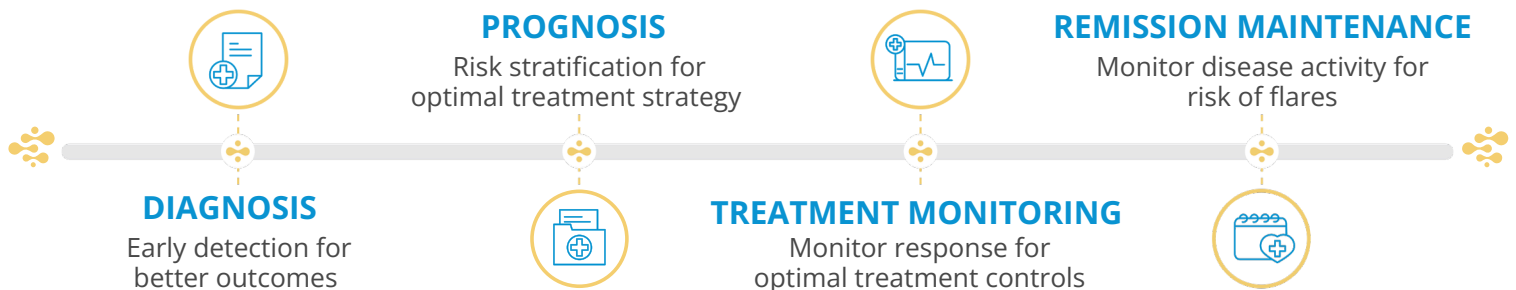
- ⊗ Decreases in 14-3-3eta levels in response to therapy are associated with better clinical outcomes. (*Shovman 2019*)
- ⊗ Increases or sustained 14-3-3eta levels are associated with a worse prognosis. (*Hirata 2015; Carrier 2016*)
- ⊗ Levels of 14-3-3eta  $\geq 0.50$  ng/mL indicates significant joint damage risk. (*Carrier 2016; Carrier 2020*)
- ⊗ 14-3-3eta and CRP do not correlate, and represent independent predictors of joint damage progression.
- ⊗ High CRP ( $>8.0$  mg/L) and 14-3-3eta protein ( $\geq 0.50$  ng/mL) represents an adverse prognostic signature.



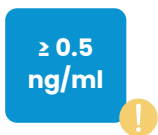
**i** **Uncouple joint damage and inflammation**

Combine 14-3-3eta and CRP testing (every 3-6 months) to monitor disease activity and assist with tight treatment control strategies in RA.

## 14-3-3eta is a mechanistic and modifiable biomarker, providing clinical utility from early diagnosis to remission



Serial decreases of 14-3-3eta levels in response to therapy are associated with better clinical outcomes. (*Sornasse 2020*)



Levels of 14-3-3eta  $\geq 0.5$  ng/mL indicates a higher risk of radiographic progression and flare, even in patients who are in SDAI remission. (*Carrier 2016*)



Serial increases or sustained 14-3-3eta levels are associated with worse outcomes, and indicates treatment options should be reassessed. (*Hirata 2015*)

**Confidently maintain patients in remission**

- ⊗ **Guidance for Remission Maintenance**  
Monitoring 14-3-3eta and CRP can help identify patients at higher risk of radiographic progression, aiding in more informed decisions on dose tapering and remission maintenance (*Carrier 2016*)
- ⊗ **Predictive Value for Flare Risk**  
Higher 14-3-3eta levels at baseline, especially when combined with low CRP, are strong predictors of flare risk in patients discontinuing biologic therapy. (*Hirata 2017*)

## 14-3-3eta ASRs are available as an LDT at the following labs:

Quest Diagnostics	
Test Name	Test Code
14-3-3eta Protein	91455

Labcorp	
Test Name	Test Code
14-3-3eta Protein	504550
RheumAssure® (14-3-3eta, RF, anti-CCP)	504509
RAdx6 Profile (14-3-3eta, RF, anti-CCP, anti-CEP1, anti-Sa, anti-CarP)	520304
SeroNeg RAdx4 Profile (14-3-3eta, anti-CEP1, anti-Sa, anti-CarP)	520305
RA Profile with Reflex to SeroNeg RAdx4 (RF & anti-CCP, reflex to: 14-3-3eta, anti-CEP1, anti-Sa, anti-CarP)	520298

ARUP Laboratories	
Test Name	Test Code
14-3-3eta Protein	3017890
Early and Established Rheumatoid Arthritis (RA) Panel (14-3-3eta, RF, anti-CCP)	3017891

## COMING SOON

Sonic Healthcare USA	
Divisions	Test Code
Clinical Pathology Laboratories	Available Dec, 2024
Sunrise Medical Laboratories	Available Dec, 2024
East Side Clinical Laboratory	Available Dec, 2024
Sonic Reference Laboratory	Available Dec, 2024
American Esoteric Laboratories	Available Dec, 2024
Pathology Laboratories	Available Dec, 2024
Clinical Labs of Hawaii	Available Dec, 2024

## References

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