



Selective involvement of serum response factor in pressure-induced myogenic tone in resistance arteries

Submitted by Emmanuel Lemoine on Tue, 02/24/2015 - 16:11

Titre	Selective involvement of serum response factor in pressure-induced myogenic tone in resistance arteries
Type de publication	Article de revue
Auteur	Retailleau, Kevin [1], Toutain, Bertrand [2], Galmiche, G. [3], Fassot, Céline [4], Sharif-Naeini, R. [5], Kauffenstein, Gilles [6], Mericskay, M. [7], Duprat, Fabrice [8], Grimaud, Linda [9], Merot, J. [10], Lardeux, A. [11], Pizard, A. [12], Baudrie, Véronique [13], Jeunemaitre, Xavier [14], Feil, R. [15], Gothert, J. R [16], Lacolley, P. [17], Henrion, Daniel [18], Li, Z. [19], Loufrani, Laurent [20]
Editeur	American Heart Association
Type	Article scientifique dans une revue à comité de lecture
Année	2012
Langue	Anglais
Date	2012
Numéro	2
Pagination	339 - 46
Volume	33
Titre de la revue	Arteriosclerosis, Thrombosis, and Vascular Biology
ISSN	1524-4636
Mots-clés	Actins [21], Animals [22], Arterial Pressure/drug effects [23], Arteries/metabolism [24], Blotting, Western [25], Calcium Signaling [26], Contractile Proteins/metabolism [27], Dose-Response Relationship, Drug [28], Filamins [29], Gene Expression Regulation [30], Male [31], Mechanotransduction, Cellular [32], Membrane Potentials [33], Mice [34], Mice, Knockout [35], Microfilament Proteins/metabolism [36], Microscopy, Confocal [37], Muscle, Smooth, Vascular/drug effects/metabolism [38], Myography [39], Myosin Light Chains/metabolism [40], Myosin-Light-Chain Kinase/metabolism [41], p38 Mitogen-Activated Protein Kinases/antagonists & inhibitors/metabolism [42], Patch-Clamp Techniques [43], Protein Kinase Inhibitors/pharmacology [44], Real-Time Polymerase Chain Reaction [45], Reverse Transcriptase Polymerase Chain Reaction [46], RNA, Messenger/metabolism [47], Serum Response Factor/deficiency/genetics/metabolism [48], Tail/blood supply [49], Time Factors [50], Vascular Resistance/drug effects [51], Vasoconstriction/drug effects [52], Vasoconstrictor Agents/pharmacology [53], Vasodilation/drug effects [54], Vasodilator Agents/pharmacology [55]

OBJECTIVE: In resistance arteries, diameter adjustment in response to pressure changes depends on the vascular cytoskeleton integrity. Serum response factor (SRF) is a dispensable transcription factor for cellular growth, but its role remains unknown in resistance arteries. We hypothesized that SRF is required for appropriate microvascular contraction. METHODS AND RESULTS: We used mice in which SRF was specifically deleted in smooth muscle or endothelial cells, and their control. Myogenic tone and pharmacological contraction was determined in resistance arteries. mRNA and protein expression were assessed by quantitative real-time PCR (qRT-PCR) and Western blot. Actin polymerization was determined by confocal microscopy. Stress-activated channel activity was measured by patch clamp. Myogenic tone developing in response to pressure was dramatically decreased by SRF deletion (5.9+/-2.3%) compared with control (16.3+/-3.2%). This defect was accompanied by decreases in actin polymerization, filamin A, myosin light chain kinase and myosin light chain expression level, and stress-activated channel activity and sensitivity in response to pressure. Contractions induced by phenylephrine or U46619 were not modified, despite a higher sensitivity to p38 blockade; this highlights a compensatory pathway, allowing normal receptor-dependent contraction. CONCLUSIONS: This study shows for the first time that SRF has a major part to play in the control of local blood flow via its central role in pressure-induced myogenic tone in resistance arteries.

Résumé en anglais

URL de la notice <http://okina.univ-angers.fr/publications/ua8405> [56]

DOI [10.1161/ATVBAHA.112.300708](https://doi.org/10.1161/ATVBAHA.112.300708) [57]

Lien vers le document <http://dx.doi.org/10.1161/ATVBAHA.112.300708> [57]

Titre abrégé Arterioscler Thromb Vasc Biol

Liens

- [1] [http://okina.univ-angers.fr/publications?f\[author\]=1124](http://okina.univ-angers.fr/publications?f[author]=1124)
- [2] <http://okina.univ-angers.fr/bertrand.toutain/publications>
- [3] [http://okina.univ-angers.fr/publications?f\[author\]=14167](http://okina.univ-angers.fr/publications?f[author]=14167)
- [4] <http://okina.univ-angers.fr/celine.fassot/publications>
- [5] [http://okina.univ-angers.fr/publications?f\[author\]=14893](http://okina.univ-angers.fr/publications?f[author]=14893)
- [6] [http://okina.univ-angers.fr/publications?f\[author\]=4686](http://okina.univ-angers.fr/publications?f[author]=4686)
- [7] [http://okina.univ-angers.fr/publications?f\[author\]=14168](http://okina.univ-angers.fr/publications?f[author]=14168)
- [8] [http://okina.univ-angers.fr/publications?f\[author\]=25507](http://okina.univ-angers.fr/publications?f[author]=25507)
- [9] <http://okina.univ-angers.fr/linda.grimaud/publications>
- [10] [http://okina.univ-angers.fr/publications?f\[author\]=14895](http://okina.univ-angers.fr/publications?f[author]=14895)
- [11] [http://okina.univ-angers.fr/publications?f\[author\]=14896](http://okina.univ-angers.fr/publications?f[author]=14896)
- [12] [http://okina.univ-angers.fr/publications?f\[author\]=13766](http://okina.univ-angers.fr/publications?f[author]=13766)
- [13] [http://okina.univ-angers.fr/publications?f\[author\]=595](http://okina.univ-angers.fr/publications?f[author]=595)
- [14] [http://okina.univ-angers.fr/publications?f\[author\]=599](http://okina.univ-angers.fr/publications?f[author]=599)
- [15] [http://okina.univ-angers.fr/publications?f\[author\]=14174](http://okina.univ-angers.fr/publications?f[author]=14174)
- [16] [http://okina.univ-angers.fr/publications?f\[author\]=14899](http://okina.univ-angers.fr/publications?f[author]=14899)
- [17] [http://okina.univ-angers.fr/publications?f\[author\]=13771](http://okina.univ-angers.fr/publications?f[author]=13771)
- [18] <http://okina.univ-angers.fr/d.henrion/publications>
- [19] [http://okina.univ-angers.fr/publications?f\[author\]=13877](http://okina.univ-angers.fr/publications?f[author]=13877)
- [20] <http://okina.univ-angers.fr/laurent.loufrani/publications>
- [21] [http://okina.univ-angers.fr/publications?f\[keyword\]=8361](http://okina.univ-angers.fr/publications?f[keyword]=8361)
- [22] [http://okina.univ-angers.fr/publications?f\[keyword\]=964](http://okina.univ-angers.fr/publications?f[keyword]=964)
- [23] [http://okina.univ-angers.fr/publications?f\[keyword\]=13865](http://okina.univ-angers.fr/publications?f[keyword]=13865)

- [24] [http://okina.univ-angers.fr/publications?f\[keyword\]=13867](http://okina.univ-angers.fr/publications?f[keyword]=13867)
- [25] [http://okina.univ-angers.fr/publications?f\[keyword\]=1425](http://okina.univ-angers.fr/publications?f[keyword]=1425)
- [26] [http://okina.univ-angers.fr/publications?f\[keyword\]=9156](http://okina.univ-angers.fr/publications?f[keyword]=9156)
- [27] [http://okina.univ-angers.fr/publications?f\[keyword\]=13868](http://okina.univ-angers.fr/publications?f[keyword]=13868)
- [28] [http://okina.univ-angers.fr/publications?f\[keyword\]=1416](http://okina.univ-angers.fr/publications?f[keyword]=1416)
- [29] [http://okina.univ-angers.fr/publications?f\[keyword\]=13869](http://okina.univ-angers.fr/publications?f[keyword]=13869)
- [30] [http://okina.univ-angers.fr/publications?f\[keyword\]=9152](http://okina.univ-angers.fr/publications?f[keyword]=9152)
- [31] [http://okina.univ-angers.fr/publications?f\[keyword\]=968](http://okina.univ-angers.fr/publications?f[keyword]=968)
- [32] [http://okina.univ-angers.fr/publications?f\[keyword\]=8485](http://okina.univ-angers.fr/publications?f[keyword]=8485)
- [33] [http://okina.univ-angers.fr/publications?f\[keyword\]=9161](http://okina.univ-angers.fr/publications?f[keyword]=9161)
- [34] [http://okina.univ-angers.fr/publications?f\[keyword\]=1102](http://okina.univ-angers.fr/publications?f[keyword]=1102)
- [35] [http://okina.univ-angers.fr/publications?f\[keyword\]=1147](http://okina.univ-angers.fr/publications?f[keyword]=1147)
- [36] [http://okina.univ-angers.fr/publications?f\[keyword\]=13870](http://okina.univ-angers.fr/publications?f[keyword]=13870)
- [37] [http://okina.univ-angers.fr/publications?f\[keyword\]=1588](http://okina.univ-angers.fr/publications?f[keyword]=1588)
- [38] [http://okina.univ-angers.fr/publications?f\[keyword\]=13871](http://okina.univ-angers.fr/publications?f[keyword]=13871)
- [39] [http://okina.univ-angers.fr/publications?f\[keyword\]=13872](http://okina.univ-angers.fr/publications?f[keyword]=13872)
- [40] [http://okina.univ-angers.fr/publications?f\[keyword\]=13441](http://okina.univ-angers.fr/publications?f[keyword]=13441)
- [41] [http://okina.univ-angers.fr/publications?f\[keyword\]=13873](http://okina.univ-angers.fr/publications?f[keyword]=13873)
- [42] [http://okina.univ-angers.fr/publications?f\[keyword\]=13874](http://okina.univ-angers.fr/publications?f[keyword]=13874)
- [43] [http://okina.univ-angers.fr/publications?f\[keyword\]=9184](http://okina.univ-angers.fr/publications?f[keyword]=9184)
- [44] [http://okina.univ-angers.fr/publications?f\[keyword\]=11395](http://okina.univ-angers.fr/publications?f[keyword]=11395)
- [45] [http://okina.univ-angers.fr/publications?f\[keyword\]=11559](http://okina.univ-angers.fr/publications?f[keyword]=11559)
- [46] [http://okina.univ-angers.fr/publications?f\[keyword\]=6404](http://okina.univ-angers.fr/publications?f[keyword]=6404)
- [47] [http://okina.univ-angers.fr/publications?f\[keyword\]=13072](http://okina.univ-angers.fr/publications?f[keyword]=13072)
- [48] [http://okina.univ-angers.fr/publications?f\[keyword\]=13875](http://okina.univ-angers.fr/publications?f[keyword]=13875)
- [49] [http://okina.univ-angers.fr/publications?f\[keyword\]=13876](http://okina.univ-angers.fr/publications?f[keyword]=13876)
- [50] [http://okina.univ-angers.fr/publications?f\[keyword\]=6070](http://okina.univ-angers.fr/publications?f[keyword]=6070)
- [51] [http://okina.univ-angers.fr/publications?f\[keyword\]=13349](http://okina.univ-angers.fr/publications?f[keyword]=13349)
- [52] [http://okina.univ-angers.fr/publications?f\[keyword\]=13000](http://okina.univ-angers.fr/publications?f[keyword]=13000)
- [53] [http://okina.univ-angers.fr/publications?f\[keyword\]=13199](http://okina.univ-angers.fr/publications?f[keyword]=13199)
- [54] [http://okina.univ-angers.fr/publications?f\[keyword\]=13007](http://okina.univ-angers.fr/publications?f[keyword]=13007)
- [55] [http://okina.univ-angers.fr/publications?f\[keyword\]=13017](http://okina.univ-angers.fr/publications?f[keyword]=13017)
- [56] <http://okina.univ-angers.fr/publications/ua8405>
- [57] <http://dx.doi.org/10.1161/ATVBAHA.112.300708>

Publié sur *Okina* (<http://okina.univ-angers.fr>)